2. Specification

1. Carrier Frequencies
   1) Handset TX : 1881.792 ~ 1897.344 MHz
   2) Handset RX: 1881.792 ~ 1897.344 MHz
   3) Baseset TX : 1881.792 ~ 1897.344 MHz
   4) Baseset RX : 1881.792 ~ 1897.344 MHz

2. Number of Operating Channel / Slot : 10 Channels / 24 Slots

3. Channel Spacing : 1728 kHz

4. Frequency Drift : ◦ æ15 kHz/Slot

5. RF Power Output : Peak 250 mW (AVG. = 10 mW)

6. Frequency deviation : ◦ æ202 kHz ~ ◦ æ403 kHz

7. Speech Coding Method / Coding Rate : ADPCM / 32 kbps

8. Data Speed : 1152 kbps

9. Model Specifications
   1) Size
      - Handset : 172 X 61 X 37 [mm]
      - Baseset : 164 X 127 X 83 [mm]
   2) Weight
      - Handset : 158 [g]
      - Baseset : 223 [g]

10. Environmental Conditions
   1) Operating Temperature : - 10 ° .~ + 40 ° …
   2) Power Supply
      - Baseset : AC/DC Adaptor
        ¶ Input : AC 230 V 50 Hz
        ¶ Output : DC 9 V 150 mA, DC 9 V 400 mA Dual output Type.
      - Handset : Rechargeable Ni-MH Battery (DC 1.2 V x 3 pcs/530 mAH)

11. Charging & Discharging Currents of Handset
   1) Charging Current
      - Normal Charge : 60 ◦ æ10 mAH
      - Trickle Charge : 15 ◦ æ10 mAH
   2) Consumption Current
      - Talk Mode : Less Than 70 mAH
      - Standby Mode : Less Than 10 mAH
      - Power off Mode : Less Than 1 mAH

12. Compliances :
   CTR6
   CTR10
   CTR 22

3. Function Structures

1. Function Structures

1.1 Overview of Functional Operation

- The programming mode starts by pressing [◦]„or [◦]Â Key in Idle or Not Subscribed Mode.

- If ESC key is pressed or low voltage state is detected while carrying out the programming mode, it quits the programming mode.
  In this case, the changes are not stored and it goes back to the previous stats, Idle or Not Subscribed Mode which are previous states.

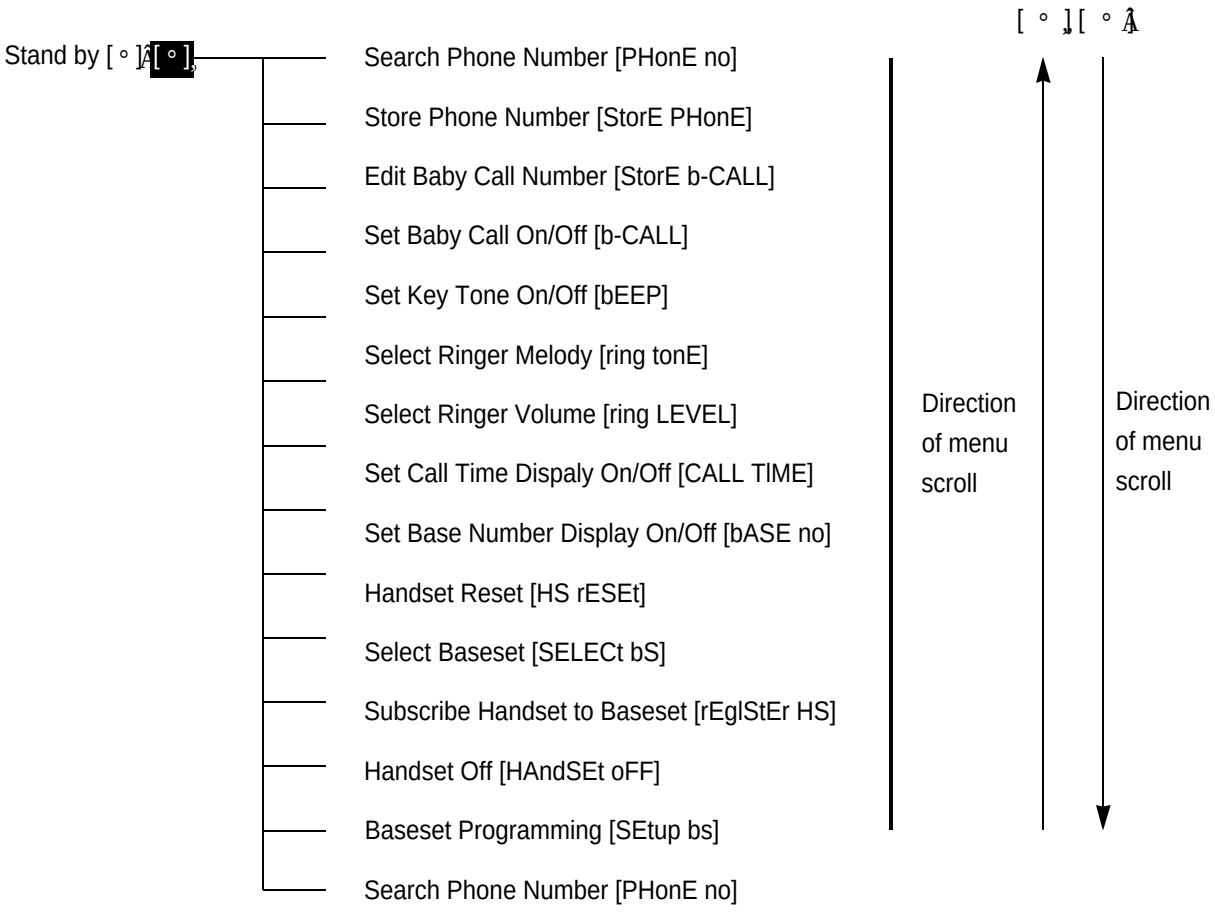
- When selecting the programming menu, some of them may not be displayed depending on the state of fixed or portable part.
  For the portable part, 'Select Baseset°Ø and 'Æ Baseset Programming°Ø menus are displayed only when the portable part is registered to more than one fixed part, otherwise they are not displayed.
  In some countries using 'Tone' only, 'Select Dial Mode' is not displayed.
  In Ciuntries using 'Flash' only, 'Select Register Recall Mode' is not displayed for the fived part.
  °Æ Long Flash°Ø menu which is a surbodinate of 'Select Register Recall Mode°Ø is displayed for the countries - currently Germany - which support this function only.

- If an incoming call is detected during the programming mode, the programming mode is cancelled and conversed to the connected state.
  However there are two exceptions.
  When registering the portable part to the fixed part and the portable part is not registered to the fixed part.
  In such cases incoming call will be ignored.

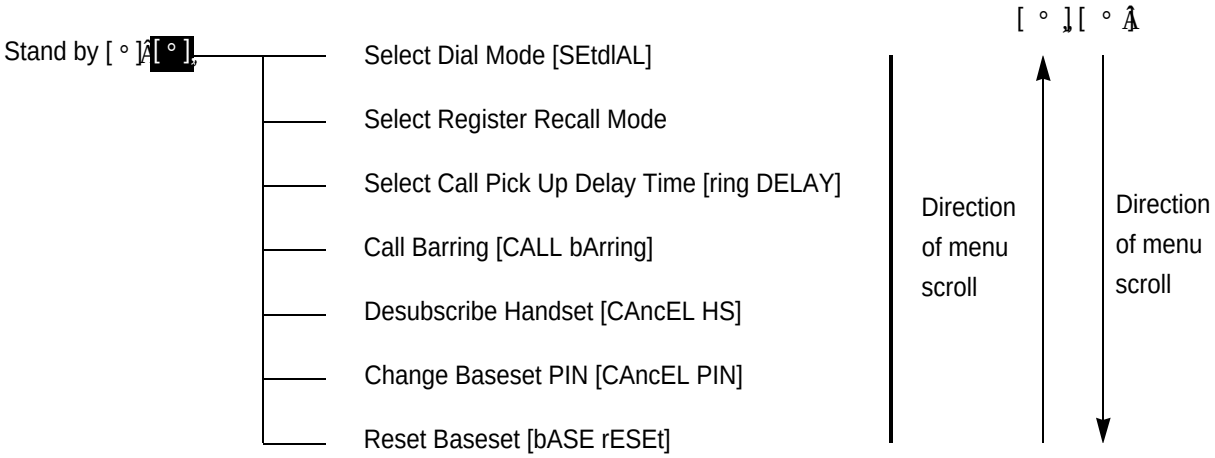
- In the programming mode,it ignores the unrelated inputs.
  It goes back to Idle Mode or Not Subscribed Mode with audible sound When the installation of functions is completed normal.

1.2 Function tree

1.2.1 Function tree related with portable part


Stand by
Search Phone Number [PHonE no]
Store Phone Number [StorE PHonE]
Edit Baby Call Number [StorE b-CALL]
Set Baby Call On/Off [b-CALL]
Set Key Tone On/Off [bEEP]
Select Ringer Melody [ring tonE]
Select Ringer Volume [ring LEVEL]
Set Call Time Dispaly On/Off [CALL TIME]
Set Base Number Display On/Off [bASE no]
Handset Reset [HS rESEt]
Select Baseset [SELECt bS]
Subscribe Handset to Baseset [rEglStEr HS]
Handset Off [HAndSEt oFF]
Baseset Programming [SEtup bs]
Search Phone Number [PHonE no]
Direction of menu scroll
Direction of menu scroll

1.2.2 Function Tree of Baseset


Stand by
Select Dial Mode [SEtdlAL]
Select Register Recall Mode
Select Call Pick Up Delay Time [ring DELAY]
Call Barring [CALL bArring]
Desubscribe Handset [CAncEL HS]
Change Baseset PIN [CAncEL PIN]
Reset Baseset [bASE rESEt]
Direction of menu scroll
Direction of menu scroll

1.3 Function table

1.3.1 Function table related with portable part

◦ [Power]	
Pressing [OK] button for more than a sec in power off state	Power ON
Pressing [OD] button for more than a sec in power on state	Key lock set up / release
◦ [◦]Â[◦]„··· [Selecting the function]···[OK]	
[◦]Â[◦]„	Calling state - Vol. adjust Stand by state - Set up function mode
1 - SEARCH PHONE NUNMBER	Search phone number
2 - STORE PHONE NUNMBER	Store phone number
3 - STORE BABY CALL NUMBER	Store baby call number
4 - SET BABY CALL ON / OFF	Baby call set up / release
5 - SET KEY CLICK TONE ON / OFF	Key click tone set up / release
6 - SELECT RINGER MELODY	Select ringer melody
7 - SELECT RINGER VOLUME	Select ringer volume
8 - SET CALL TIME DISPLAY ON / OFF	Call time display set up / release
9 - SET BASE NUMBER DISPLAY ON / OFF	Base number display set up / release
10 -HANDSET RESET	Initialize portable part
11 -SELECT BASESET	Select fixed part
12 -SUBSCRIBE HANDSET TO BASESET	Subscribe Handset to Baseset
13 -HANDSET OFF	Handset power off
14 -BASESET PROGRAMMING MODE	Baseset programming mode

1.3.2 Function table related with fixed part

◦ BASESET PROGRAMMING MODE	
1 - SELECT DIAL MODE	Select TONE / PULSE mode
2 - SELECT REGISTER RECALL MODE	Select FLASH / EARTH mode
3 - SELECT CALL PRIORITY	Select call priority
4 - CALL BARRING	Call barring
5 - DESUBSCRIBE HANDSET	Desubscribe handset
6 - CHANGE BASESET PIN	Change baseset pin
7 - BASESET RESET	Initialize fixed part

4. Test Mode

1. Structures of TEST PROGRAM

1.1 The files neccessary for TEST PROGRAM execution

1.1.1 Neccessary files for executing program

Following files should be installed for TEST PROGRAM execution

- JIGPCx.EXE : TEST execution program
- BASEEMC.DAT : stores the EMC code of Baseset
- HANDEMC.DAT : stores the EMC code of Handset
- BASEFLAG.DAT : stores the Flag information for requesting the new EMC code of BASESET
- HANDFLAG.DAT : stores the Flag information for requesting the new EMC code of HANDSET
- IPEI.DAT : stores the IPEI currently working
- RFPI.DAT : stores the RFPI currently working
- PORT.DAT : stores the current established PORT number

1.1.2 The files changing during the execution of program

Following files are newly create or changed during the execution of program.

- Information files containing each country°ø PSTN OPTION
  (SWEDEN.DAT, FRANCE.DAT, GERMANY.DAT °)¶
- BASESET.DAT : Daily information of baseset serial numbers(RFPI) written during manufacturing process
- HANDSET.DAT : Daily information of handset serial numbers(IPEI) written during manufacturing process

1.2 Procedures of TEST PROGRAM execution

1.2.1 Program installation

Make a directory and copy files(explained at chaptor 1.1.1) neccessary for the execution of program. Execute JIGPCx.EXE to run the program after the completion of installation.

1.2.2 Program execution

1. Select the PC's communication port(RS-232C port) connected to IIC CONVERTOR.
   If the program is executed, "SELECT SERIAL PORT" will be displayed.
   Select PORT 1 or PORT 2. If ENTER key is pressed without designating the PORT,
   it will automatically select the port previously used.

2. Select a set to be tested.
   Select HANDSET or BASESET.
   In consequence of the selection made above, the menu on which you can choose if you revise EMC or execute test program is displayed.
   Select 'MAIN MENU' to execute the test.

3. Connect the SP-R5150 to be tested to IIC CONVERTOR and power it on.
   To set the TEST MODE in HANDSET, power on by pressing OK button with holdin INT button down.
   When the TEST MODE setup is successfully completed, TEST menu will be displayed on HANDSET LCD.
   No response in 2 seconds after sending 'TEST MODE SETUP' request to PC makes TEST MODE SETUP state end.
   HANDSET supports MANUAL TEST MODE by using its keypad. To set up MANUAL TEST MODE, press ¶ ßutton while checking 2-secondiong response.
   For the BASESET, power on by connecting power jack while holding PAGING button down.
   TEST MODE SETUP state is indicated by lighting PAGING LED on the BASESET.
   It waits the response from PC after sending 'TEST MODE setup request' to PC.
   There is no time limit unlike HANDSET. Once it's in TEST MODE state, it consistantly waits the respose.

4. Select Test Item
   PC received the 'TEST MODE setup request' from a set sends back respose and displays TEST MAIN MENU on the screcn.
   Each test item proceeds referring to the contents on LCD. To finish TEST MODE, select "0)EXIT" from the TEST MODE MENU. If you force TEST MODE to end by turning the power off, the changes may not be stored.

1.3 AUTO TEST MODE

1.3.1 CTR 6 / CTR 10 TEST

To test CTR 6 TEST MODE related to RF test, an equipment supporting CTR 6 TEST such as HP8923 is needed. CTR 10 TEST MODE is used to test functions of the phone related to voice.

1. Select "Z)TM" on MAIN TEST MENU.
2. Select CTR 6 or CTR 10. TEST MODE ends after setting up CTR 6 or CTR 10.

1.3.2 ID Writing

ID writing is used to change the serial number of the HANDSET or BASESET.
It's called RFPI for BASESET, IPEI for HANDSET.

1. Select "C)RFPI" or "C)RFPI on MAIN TEST MENU.
   Previous and next IDs are displayed.

2. Input ID

When you press any key, ID is written by adding 1. When press SHIFT-F10, written by subtracting 1. Press SHIFT-F1 to input ID directly, Esc to finish.

1.3.3 EEPROM DUMP

EEPROM DUMP is used to read the contents of the EEPROM of the BASESET or HANDSET.

It is also used to analize the causes for a inferior SET.

1. Press ALT-F on MAIN TEST MENU.
2. Input file name to save the dumped contents. If you input file name, PC gets 512 byte size contents of from the EEPROM of the set and save it as the name you input.

   It takes about 50 seconds.

1.3.4 ERROR TREATING

"COMMUNICATION ERROR" is displayed when problem occurs while tranfering data between the PC & SET.

When the message is seen, check the connection between PC & SET or state of the set.

When found no oddity try TEST MODE SETUP after getting rid of the power of the set.

1.4 MANUAL TEST MODE

1.4.1 MANUAL TEST MODE

MANUAL TEST is performed by using keypad on HANDSET.

It also works alone without separable PC & IIC CONVERTOR. Followings are suppoted in MANUAL TEST MODE.

1. CTR 6 TEST
2. CTR 10 TEST
3. SOFTWARE VERSION CHECK
4. INITIALIZE SUBSCRIPTION
5. WRITE EEPROM
6. ESCAPE MANUAL TEST MODE

   TEST MENU above performs with Up & Down scroll buttons. Searched TEST MENU is selected by pressing OK button.

1.4.2 MANUAL TEST MODE SETUP

1. To set up MANUAL TEST, press INT button then OK on HANDSET to turn the power on.
2. Press ¶ within 2-second-long TEST SETUP period. If MANUAL TEST MODE is set up correctly, "CTR 6" message (which is the first TEST MENU) appears on HANDSET LCD.

   If MANUAL TEST MODE is not set up in 2 seconds, MANUAL TEST MODE ends.

1.4.3 CTR 6 TEST

To test CTR 6 TEST MODE related to RF, an equipment supporting CTR 6 TEST such as HP8923 is needed.

1.Press Up or Down button repeatedly until “TBR 6” apprears on HANDSET LCD.
Press OK.
CTB 6 TEST MODE is set up.

1.4.4 CTR 10 TEST

CTR 10 TEST MODE is for testing functions of the phone related to voice such as Loudness test.

1.Press Up or Down button repeatedly until “TBR 10” appears on HANDSET LCD.
Press OK.
2.Input Loudness value of the HANDSET. The Loudness value ranges from 0 to 9.
The loudness level “Hign / Mid / Low” for normal state corresponds to “2 / 1 / 0”.

1.4.5 SOFTWARE VERSION CHECK

Verifying the date when the program made & its version.

1.Press Up or Down button repeatedly until “Version” messgae appears on HANDSET LCD.
Press OK. The date and version appears.

1.4.6 INITIALIZE SUBSCRIPTION

Being used to set up the HANDSET to initial state.

1.Press Up or Down button repeatedly until “CLEAR SUB” message appears on HANDSET LCD.
Press OK. It initializes registered information in EEPROM for 10 seconds. MANUAL TEST MODE ends.

1.4.7 WRITE EEPROM

Changing information Byte in EEPROM 1 for the HANDSET. Changed Information will be saved when MANUAL TEST MODE ends.

1.Press Up or Down button repeatedly until “CHANGE DATA” appears on HANDSET LCD.
Press OK.
2.Input new EEPROM address with the keypad in decimal system.
3.Search the data you want to change with Up or Down button. Press OK button to input the data.
When change made, it goes back to the previous MENU. (“CHANGE DATA”)

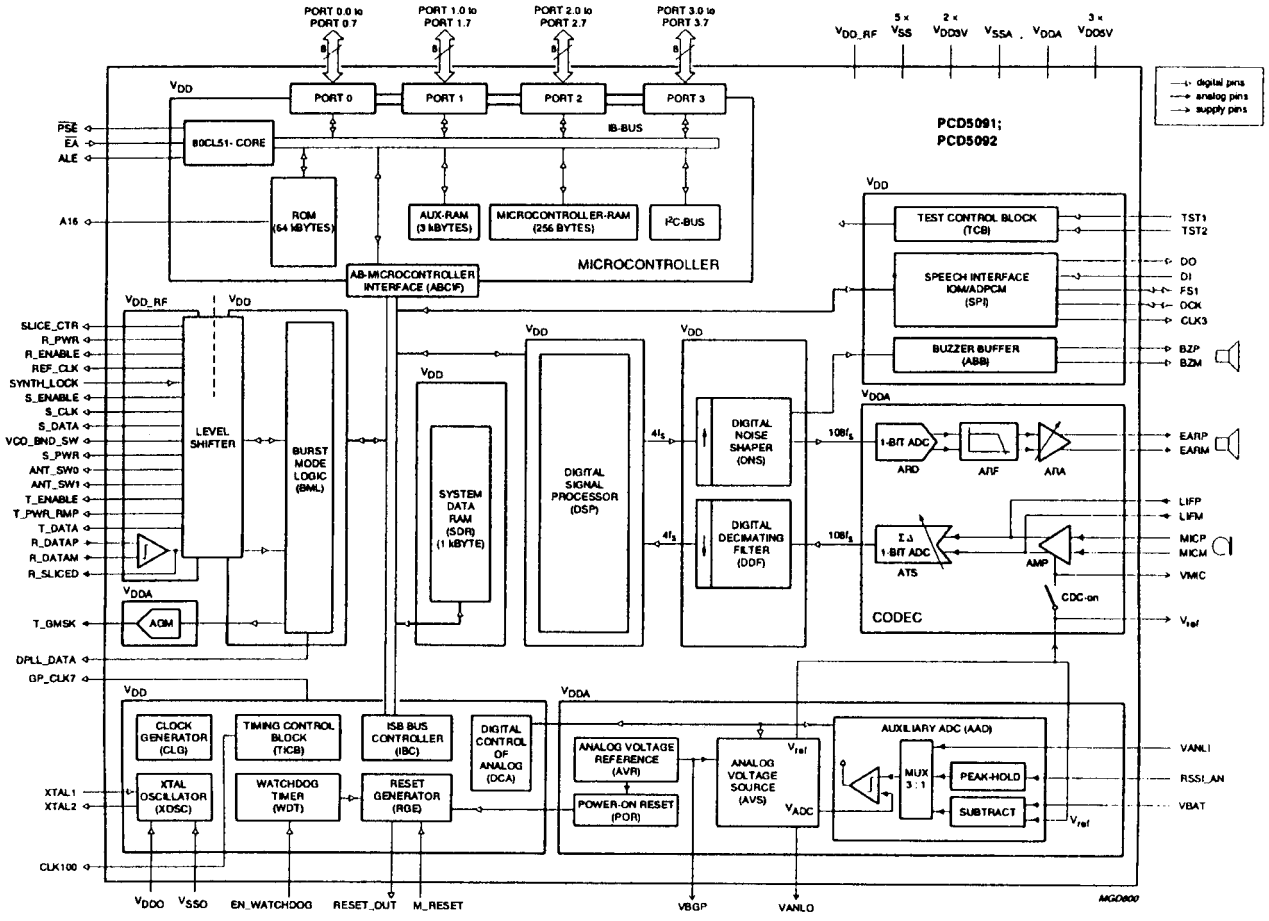
1.4.8 ESCAPE MANUAL TEST MODE

Being used to escape from MANUAL TEST MODE. If information in EEPROM has changed while running MANUAL TEST MODE. MANUAL TEST MODE ends after updating the information changed.

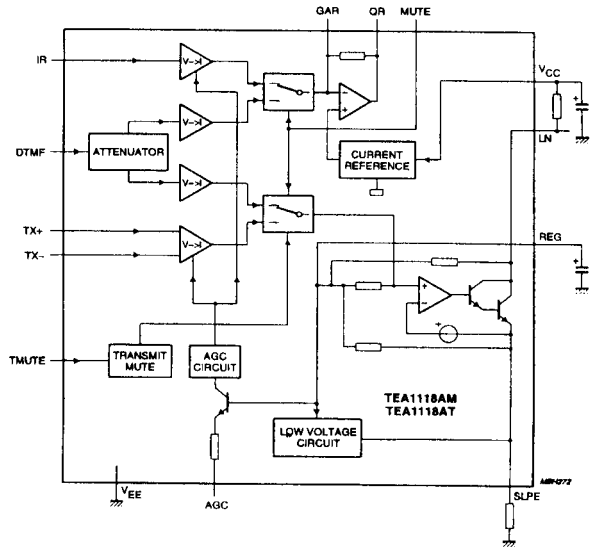
1.Press Up or Down button repeatedly until “ESCAPE TEST” message appears on the HANDSET LCD.
Press OK.
It checks if the EEPROM information has changed, if so, update new INFORMATION in the eeprom.
It takes about 10 seconds.

5. Component Pin Array

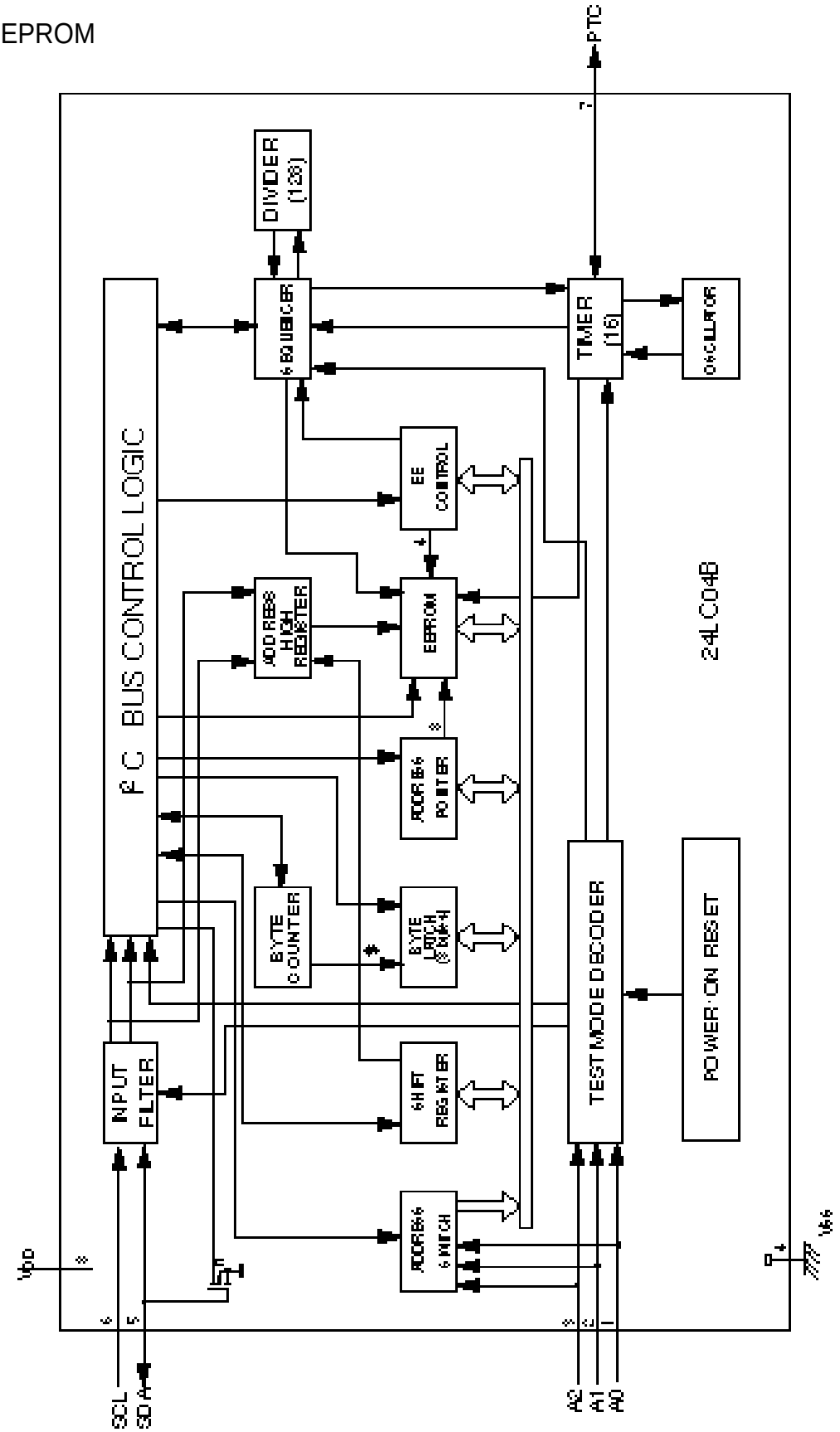
1. ABC Chip



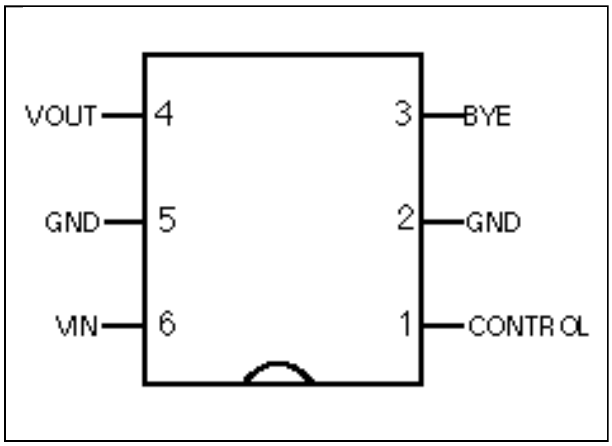
2. Speech IC



3. EEPROM

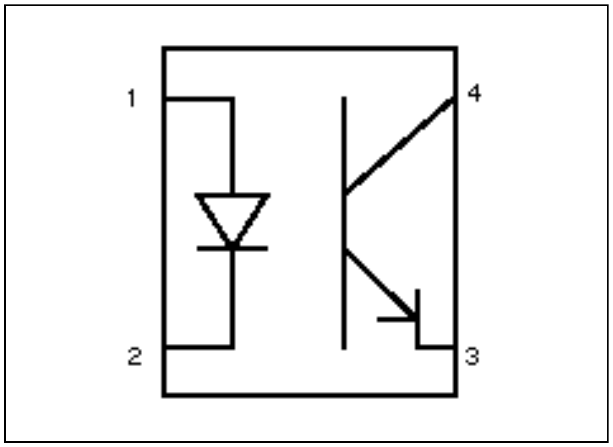

PTC
DIVIDER (128)
COMPARATOR
TIMER (16)
OSCILLATOR
I²C BUS CONTROL LOGIC
EE CONTROL
EEPROM
ADDRESS HIGH REGISTER
ADDRESS POINTER
BYTE COUNTER
BYTE LATCH (8 bit)
SHIFT REGISTER
ADDRESS COMPARATOR
INPUT FILTER
TEST MODE DECODER
POWER-ON RESET
24LC04B
SCL
SDA
A2
A1
A0

4. Votage Regulator



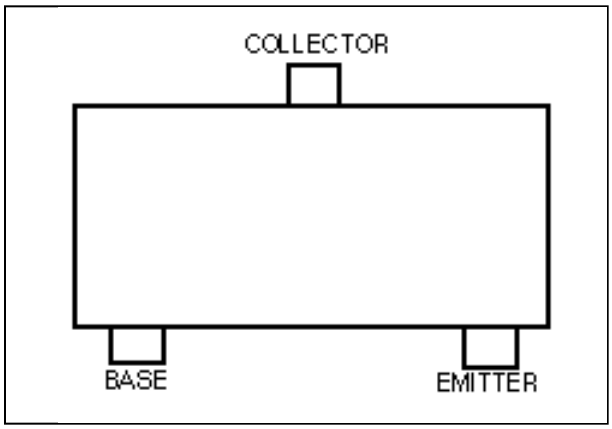
TK11233

5. Photo Coupler

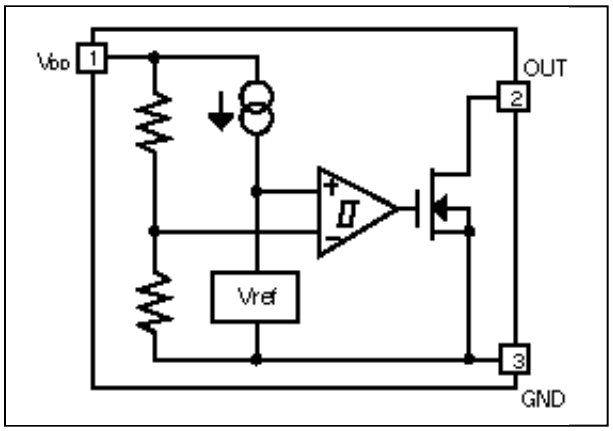


PC357

6. CHIP TR

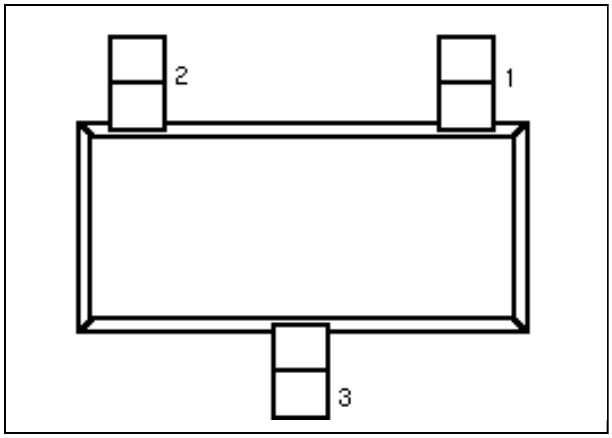


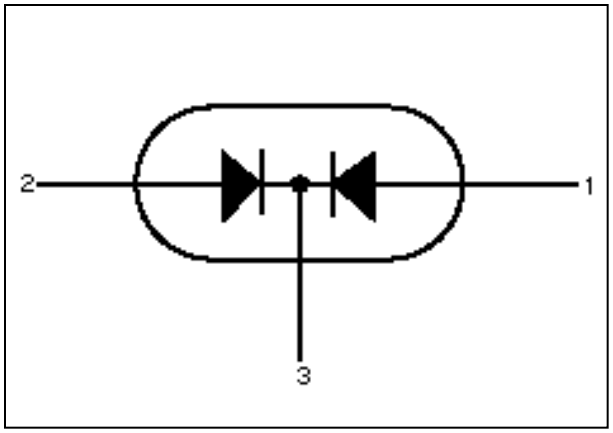
7. Voltage Detector



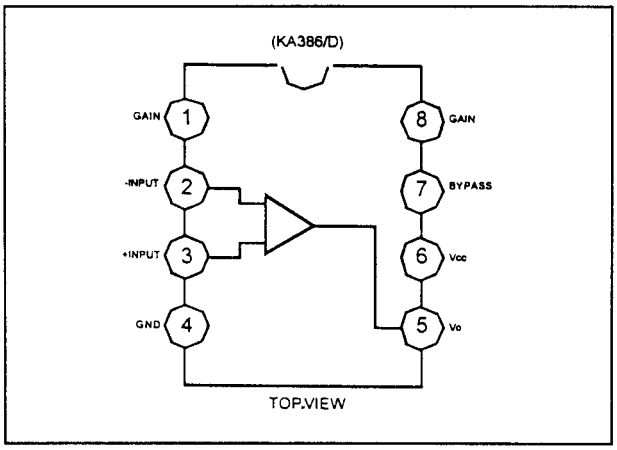
RN5VT30A

8. CHIP Diode (BAV70W)

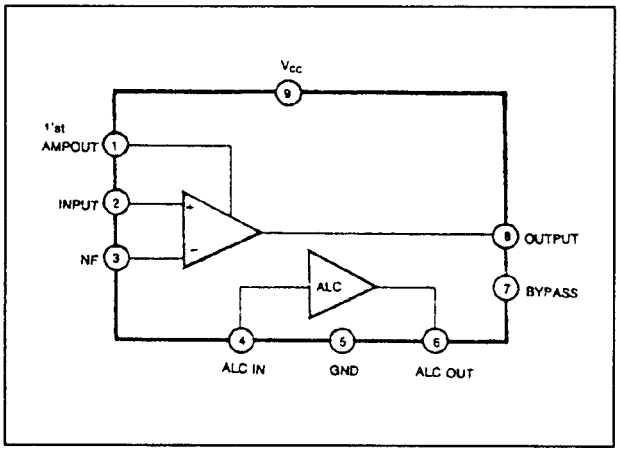




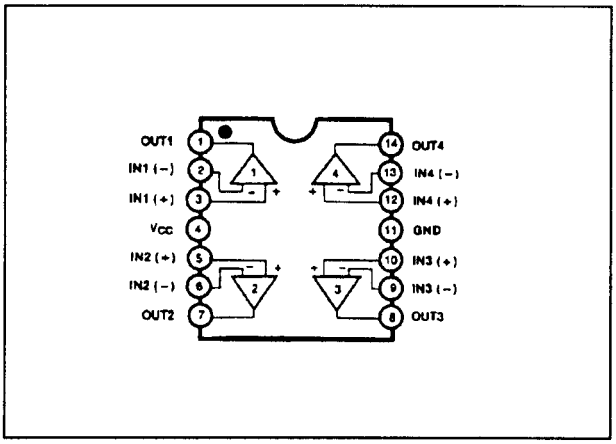
9. KA386B



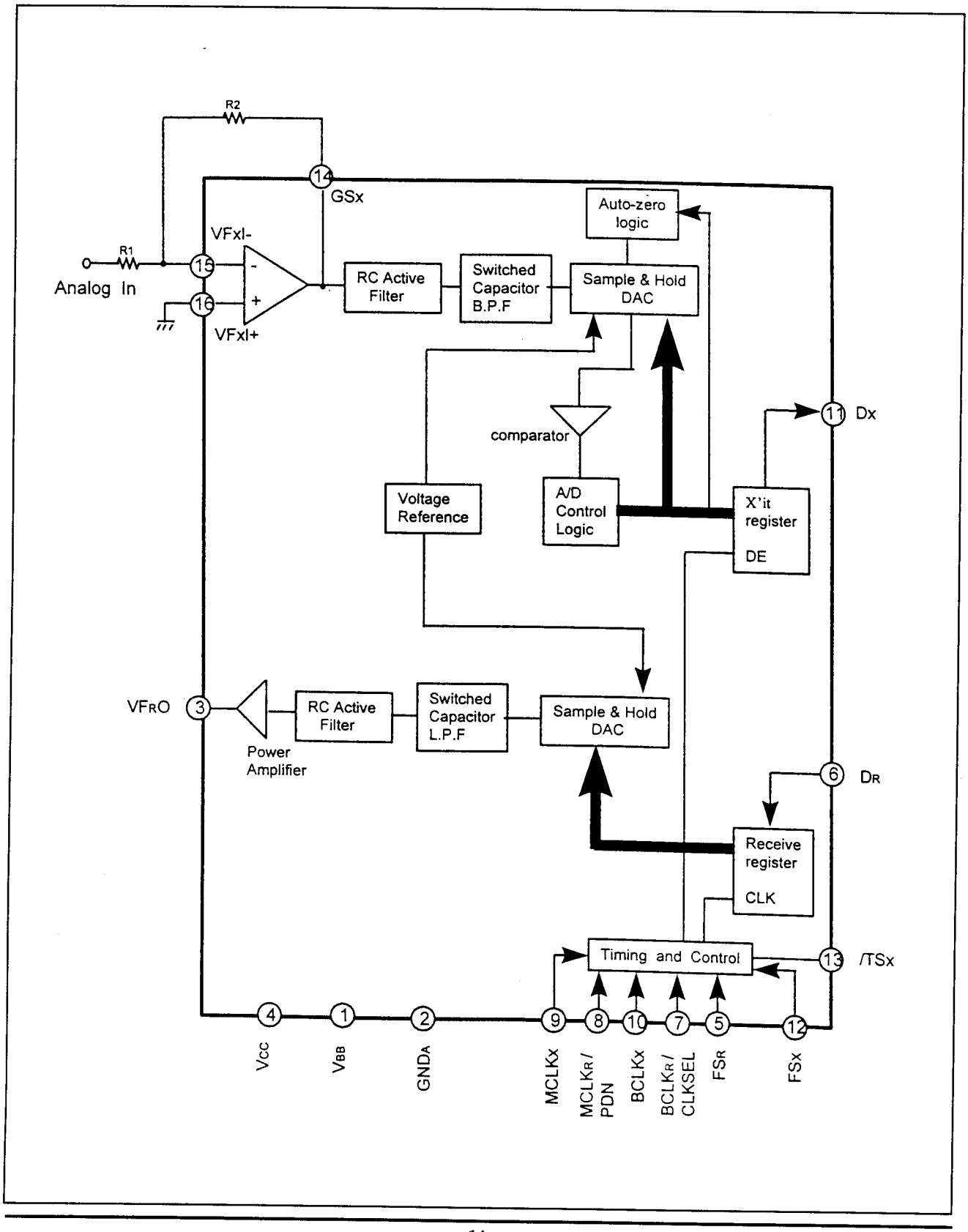
10. KA2220



11. KA324AD

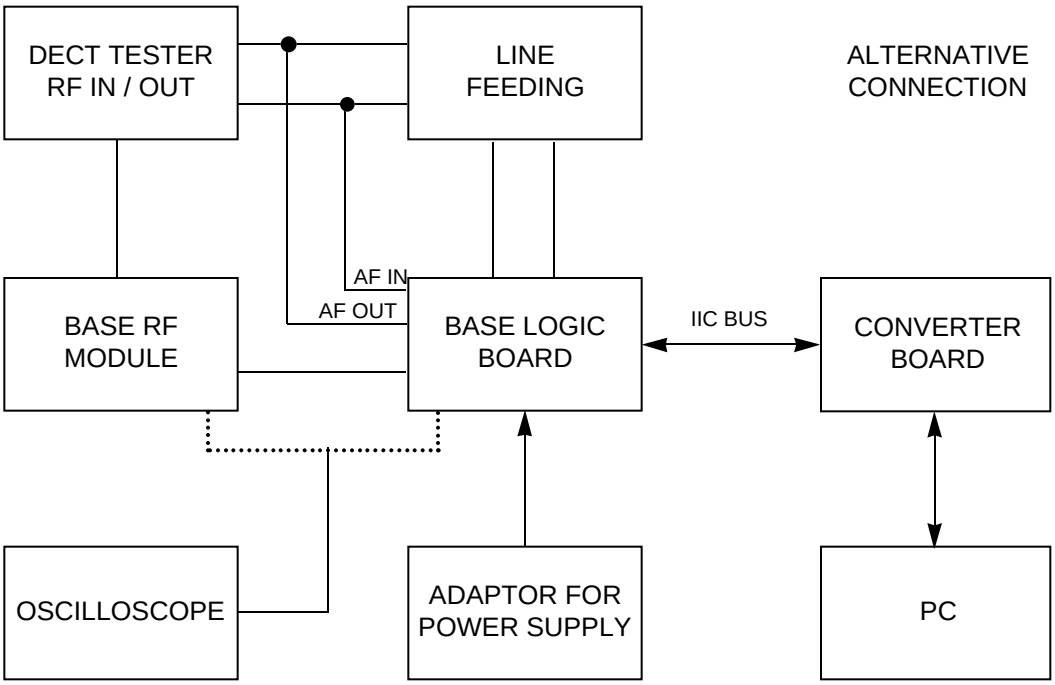


12. KA8620

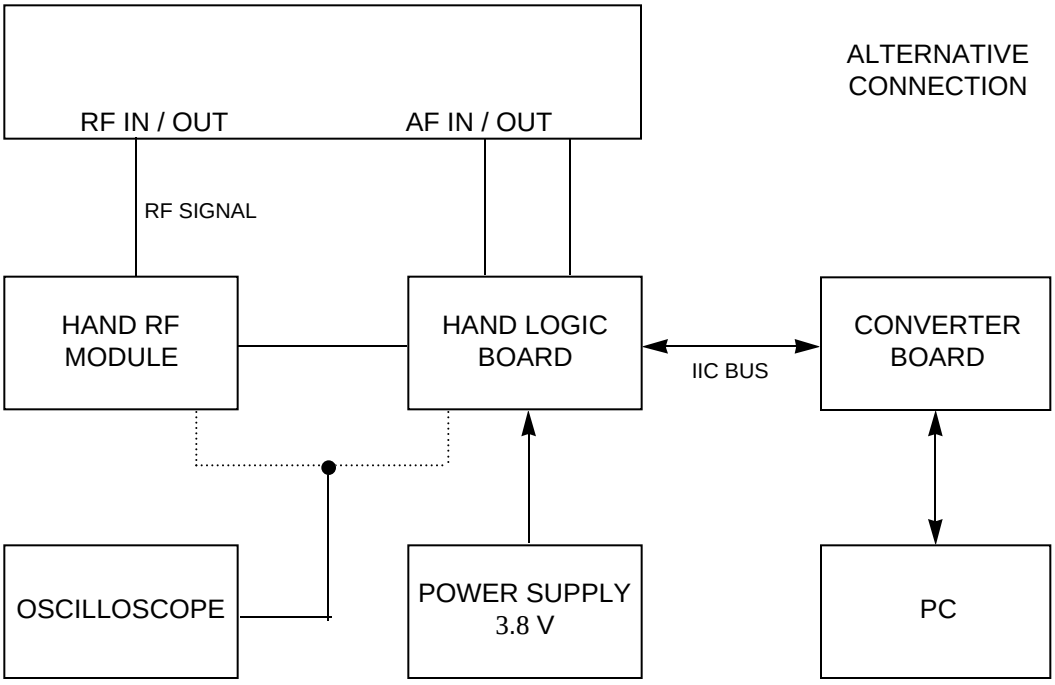

R2
14
GSx
Auto-zero logic
VFxI-
R1
Analog In
15
16
VFxI+
RC Active Filter
Switched Capacitor B.P.F
Sample & Hold DAC
comparator
11
Dx
Voltage Reference
A/D Control Logic
X'it register
DE
VFRO
3
Power Amplifier
RC Active Filter
Switched Capacitor L.P.F
Sample & Hold DAC
6
DR
Receive register
CLK
Timing and Control
13
/TSx
4
1
2
9
8
10
7
5
12
VCC
VBB
GNDA
MCLKx
MCLKR / PDN
BCLKx
BCLKR / CLKSEL
FSR
FSx

6. Alignment & Adjustment

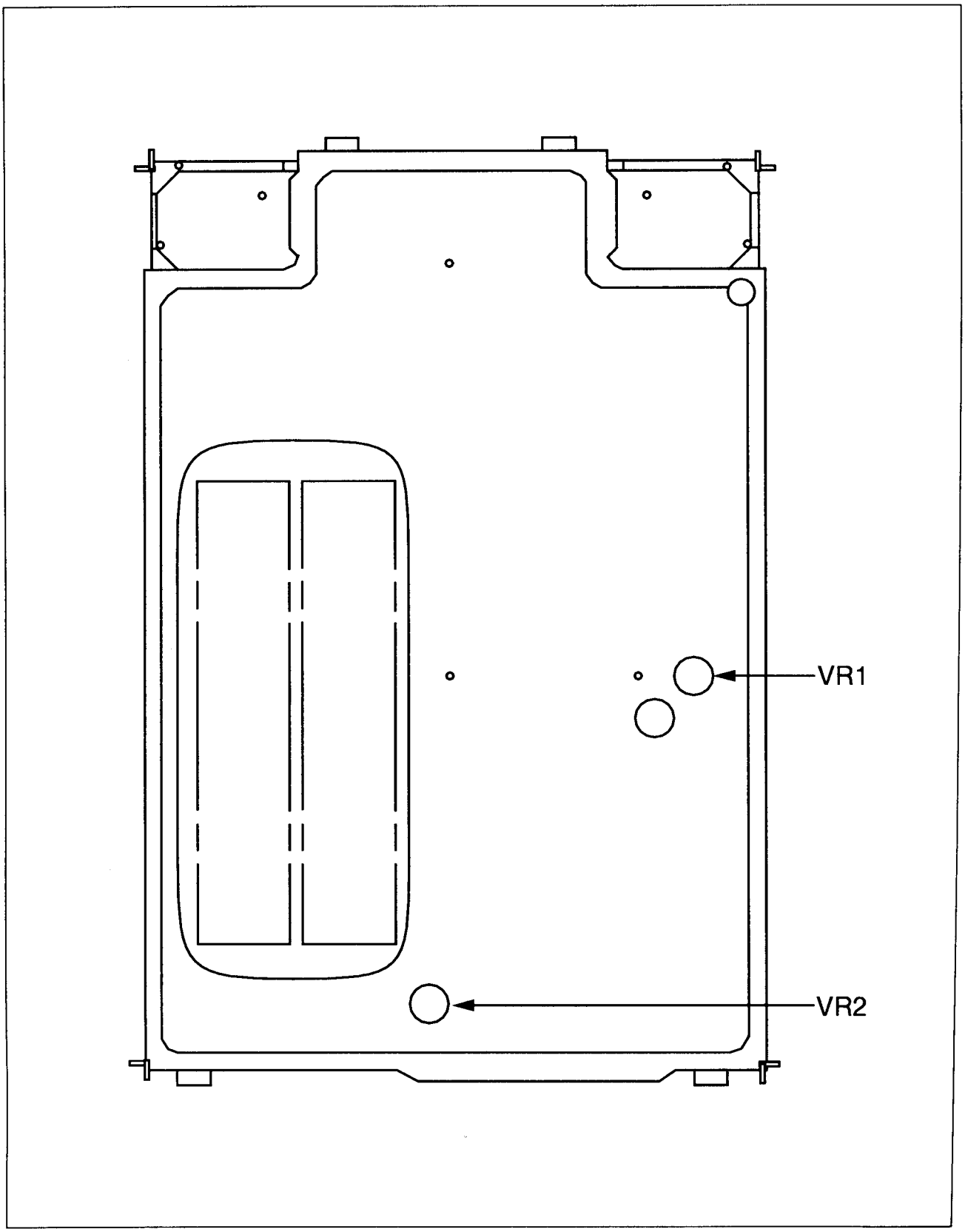
1. Alignment (Baseset RF Module)



2. Alignment (Handset RF Module)



3. Adjustment(Baseset/Handset RF Module)



4. Baseset Part

NO	ITEM	SPEC	CONDITION	TP
1	X-TAL OSC. FREQUENCY	13.824 X 10^{6} ° 30 Hz	- CONNECT BASESET TO PC - GO TO “TEST MODE” AT PC - CONNECT R98 TO FREQUENCY COUNTER - SELECT ACO AT PC - ADJUT IT TO SPEC VALUE BY PRESSING “<” OR “>” KEY AT PC	R98
2	NTP	20 dBm ~ 24 dBm	- CONNECT BASESET TO PC - CONNECT RF MODULE TO DECT TESTER - KEEP PRESSING PAGING KEY AND POWER BASESET ON - GO TO TEST MODE AT PC - SELECT TBR6 MODE - ADJUST TP1	VR1
3	FREQ. ACCURACY	fo (CH 5) ° 50 kHz	- SAME CONDITION WITH NO. 2 - ADJUST TP2	VR2
4	Vref	2 V	- CONNECT BASESET TO PC - CONNECT RF MODULE TO DECT TESTER - KEEP PRESSING PAGING KEY AND POWER BASESET ON - GO TO TEST JIG MODE - SELECT RVREF AT PC - MEASURE THE VOLTAGE OF PIN 42 OF U13 WITH VOLT METER AND ADJUST IT TO 2.0 V BY PRESSING°ÆSHIFT°ØKEY +°Ø‹°ØOR°Æ>°ØKEY AT PC	PIN 42 OF U10

° fo (CH 5) = 1881.792 MHz

5. Handset Part

NO	ITEM	SPEC	CONDITION	TP
1	X-TAL OSC. FREQUENCY	13.824 X 10^6 ° 30 Hz	- CONNECT BASESET TO PC - GO TO “TEST MODE” AT PC - CONNECT R98 TO FREQUENCY COUNTER - SELECT ACO AT PC - ADJUST IT TO SPEC VALUE BY PRESSING “<” OR “>” KEY AT PC	C137
2	NTP	20 dBm ~ 24 dBm	- CONNECT RF MODULE TO DECT TESTER - INPUT PARI NUMBER TO TESTER - GO TO TEST MODE BY PRESSING ‘POWER’ KEY + ‘F’ KEY AT POWER OFF MODE - GO TO TBR6 MODE BY PRESSING ‘1’ KEY - ADJUST TP1	VR1
3	FREQ. ACCURACY	fo (CH 5) ° 50 kHz	- SAME CONDITION WITH NO. 2 - ADJUST TP2	VR2
4	Vref	2 V	- CONNECT HANDSET TO PC - CONNECT RF MODULE TO DECT TESTER - GO TO TEST MODE BY PRESSING ‘POWER’ KEY + ‘F’ KEY AT POWER OFF MODE - GO TO TBR6 MODE BY PRESSING ‘1’ KEY - GO TO TEST MODE AT PC - SELECT RVREF - MEASURE THE VOLTAGE OF PIN 42 OF U10 WITH VOLT METER AND ADJUST IT TO 2.0 V BY PRESSING °ÆSHIFT°ØKEY +°Æ<°ØOR°Æ>°ØKEY AT PC	PIN 42 OF U13

° fo (CH 5) = 1881.792 MHz

7. Trouble Shooting

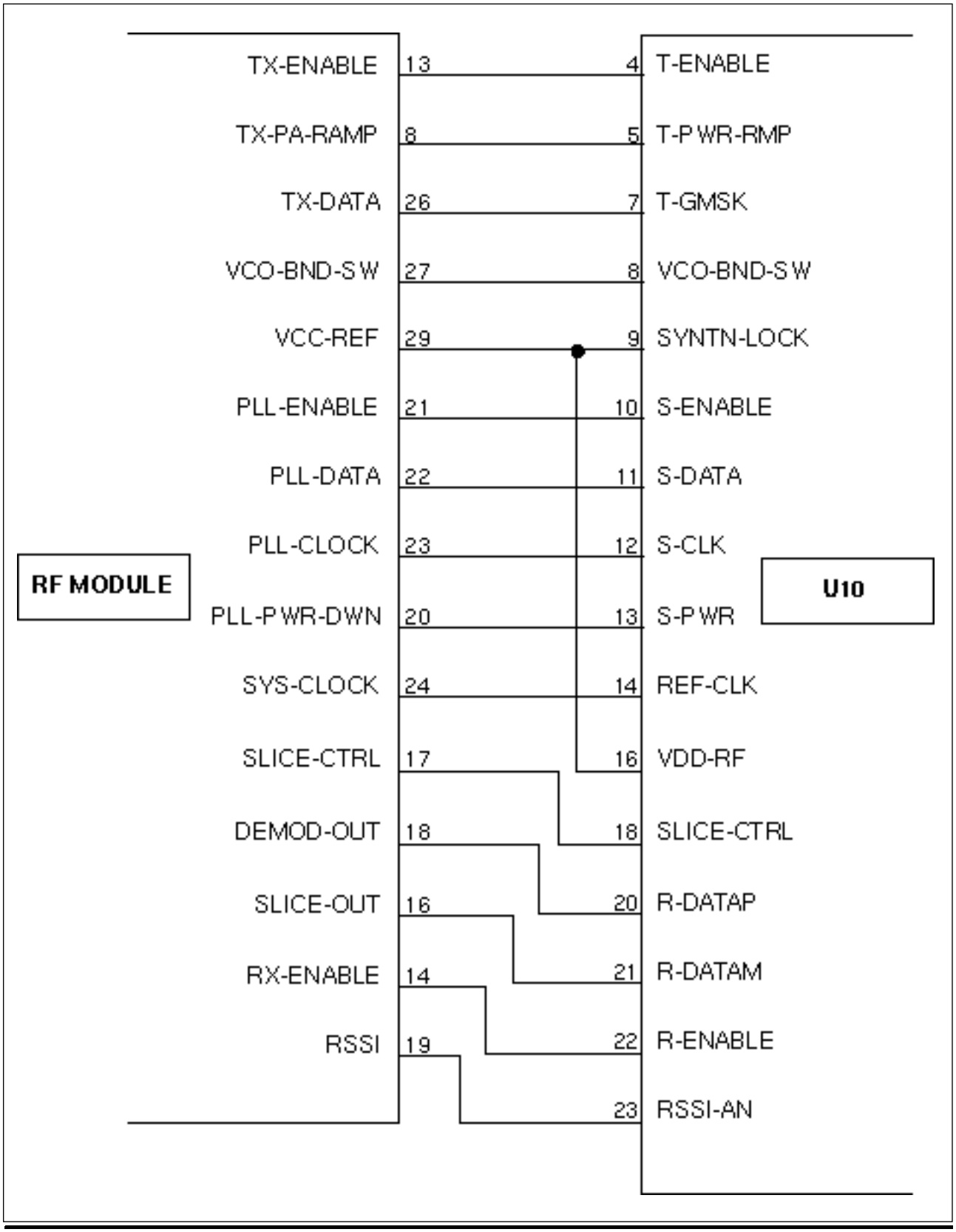
1. Trouble Shooting of RF Module

Check Points of U10 for H/S and B/S	STATUS					
	Rx			Tx		
	Idle Slot	Blind Slot	Active Slot	Idle Slot	Blind Slot	Active Slot
T_ENABLE (PIN4)	-	-	-	High	High	High
T_PWR_RMP (PIN5)	-	-	-	Low	Low	High
T_GMSK (PIN7)	-	-	-	High	High	Transmit Data
VCO_BND_SW (PIN8)	Low	Low	Low	High	High	High
SYNTH_LOCK (PIN9)	-	-	2.9 V	-	-	2.9 V
S_ENABLE (PIN10)	Low	High	Low	Low	High	Low
S_DATA (PIN11)	-	PLL Data	-	-	PLL Data	-
S_CLK (PIN12)	-	PLL CLK	-	-	PLL CLK	-
S_PWR (PIN13)	High	Low	Low	Low	Low	Low
REF_CLK (PIN14)	-	CLK	CLK	-	CLK	CLK
VDD_RF (PIN16)	-	-	2.9 V	-	-	2.9 V
SLICE_CTRL (PIN18)	High	High	Low For Short Time	-	-	-
R_DATAP (PIN20)	-	-	Demodulated Output Signal	-	-	-
R_DATAM (PIN21)	-	-	Approximately 1.4 V	-	-	-
R_ENABLE (PIN22)	High	High	Low	-	-	-
RSSI_AN (PIN23)	Level Low	Level Low	Level High (Over 1 V)	-	-	-

° Blind Slot : The Slot Before The Active Slot.

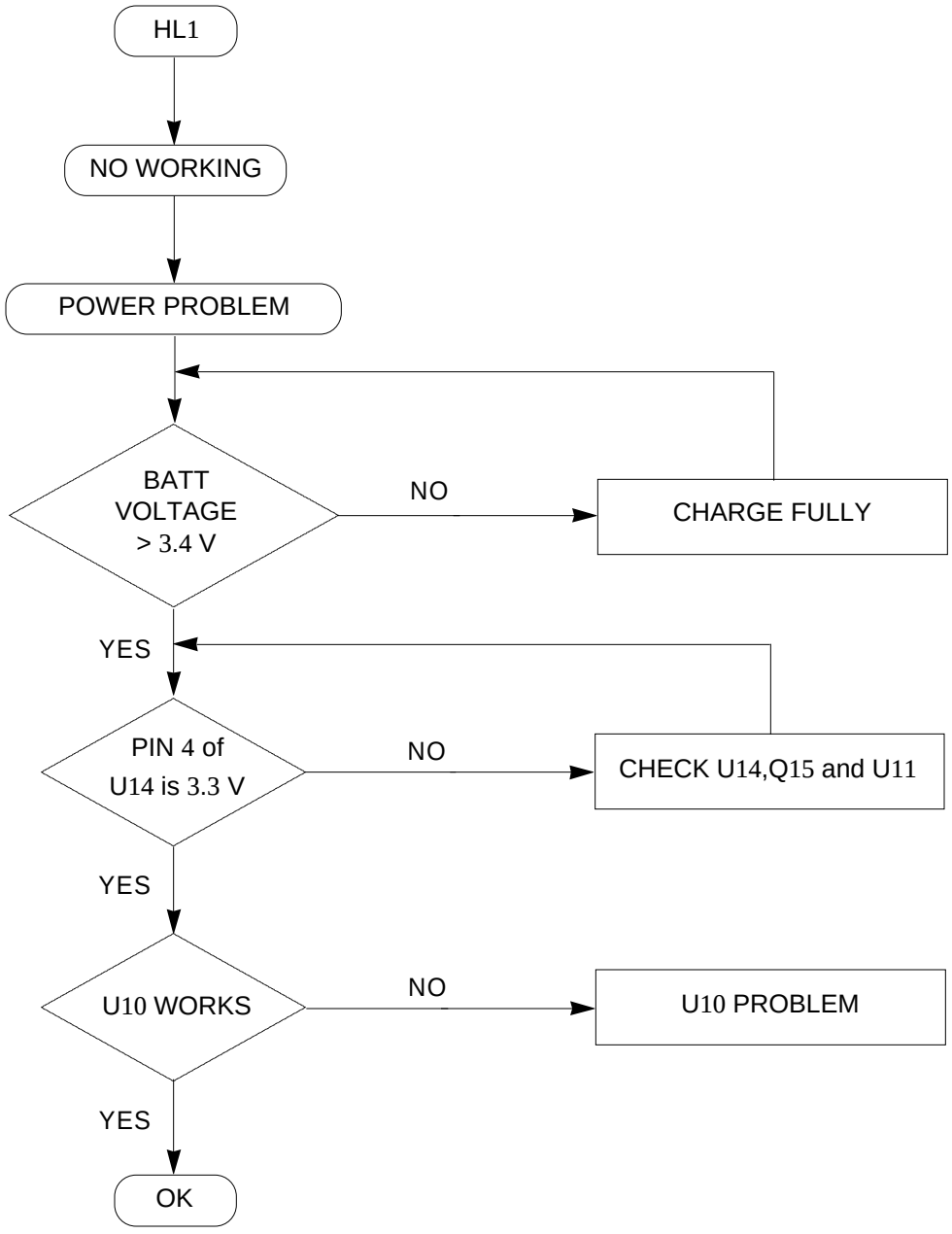
° REF CLK : In case of Baseset, It is oscillated continuously.

2. Base/Remote connections between RF Module and U10

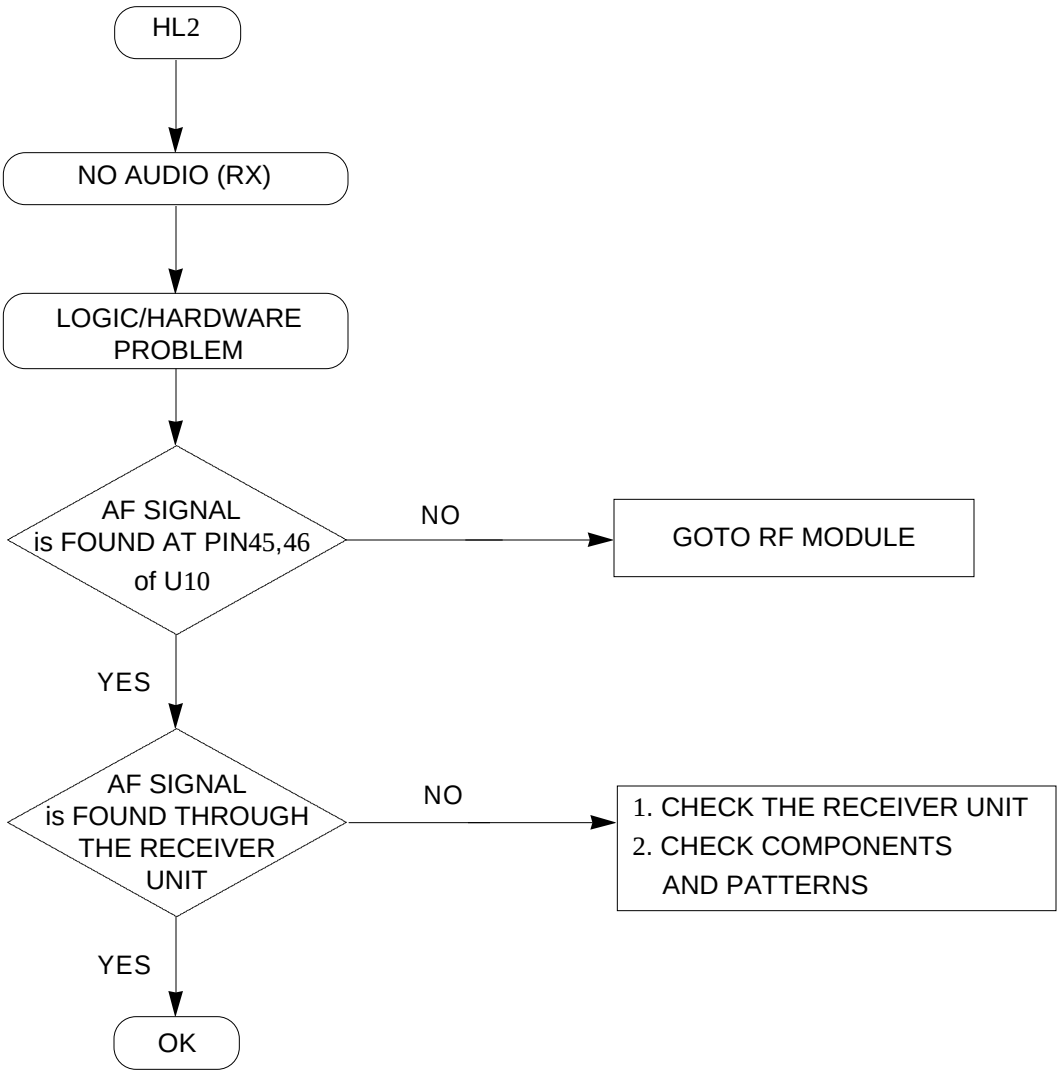


3. Trouble Shooting of Handset Logic

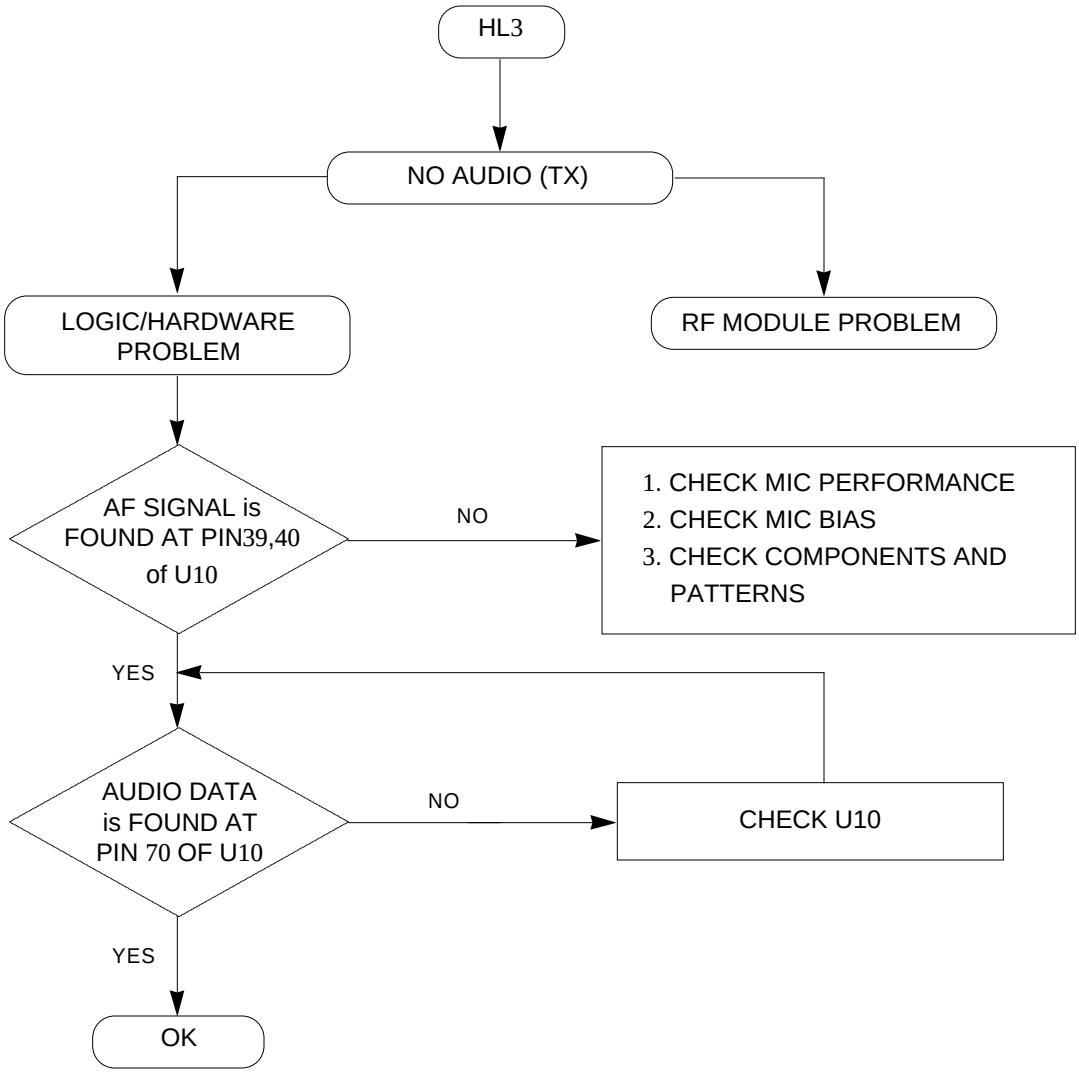
3-1. Power Problem



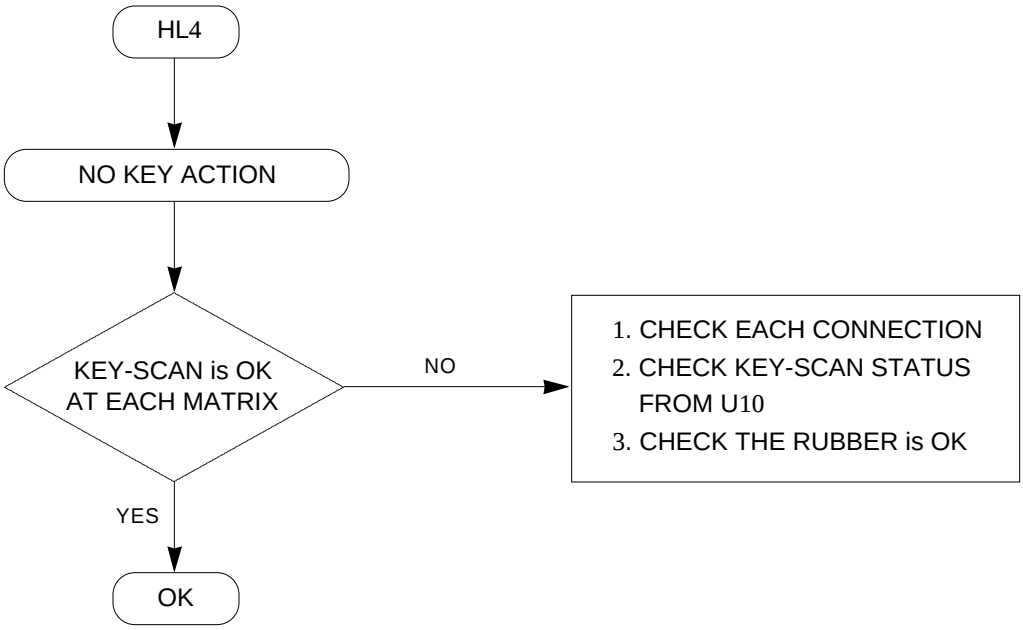
3-2. No RX Audio



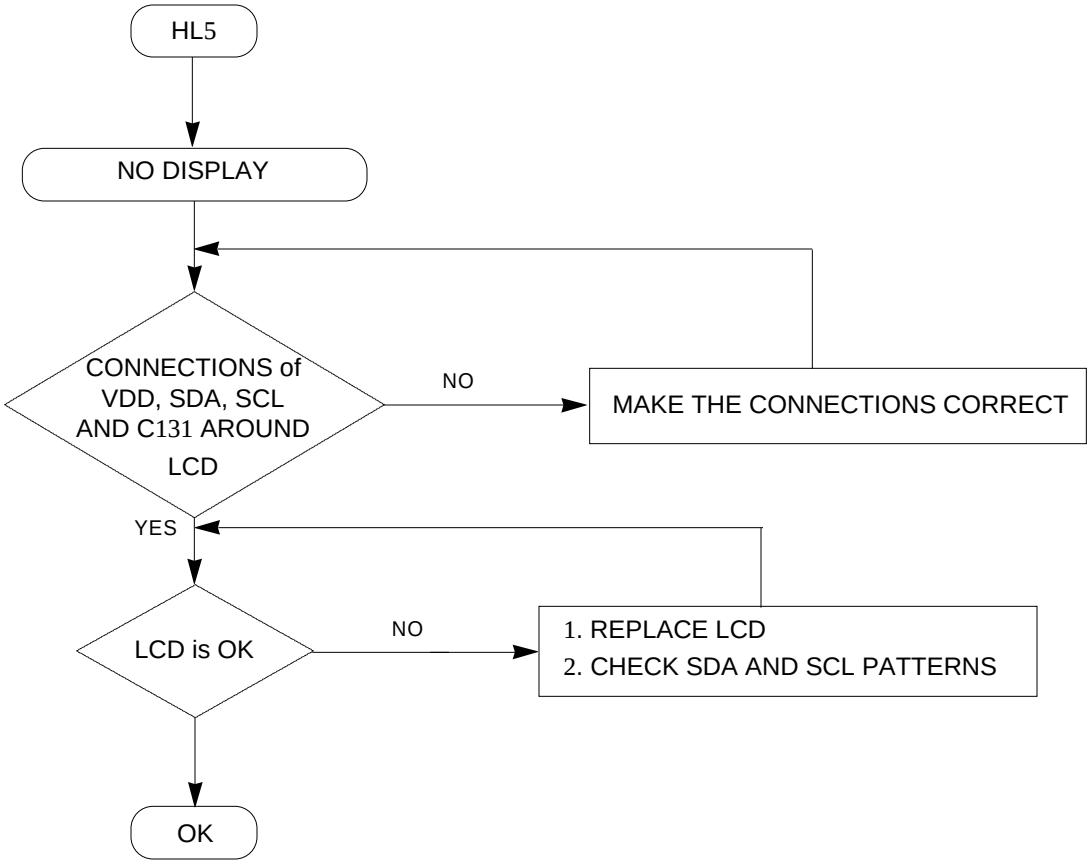
3-3. No TX Audio



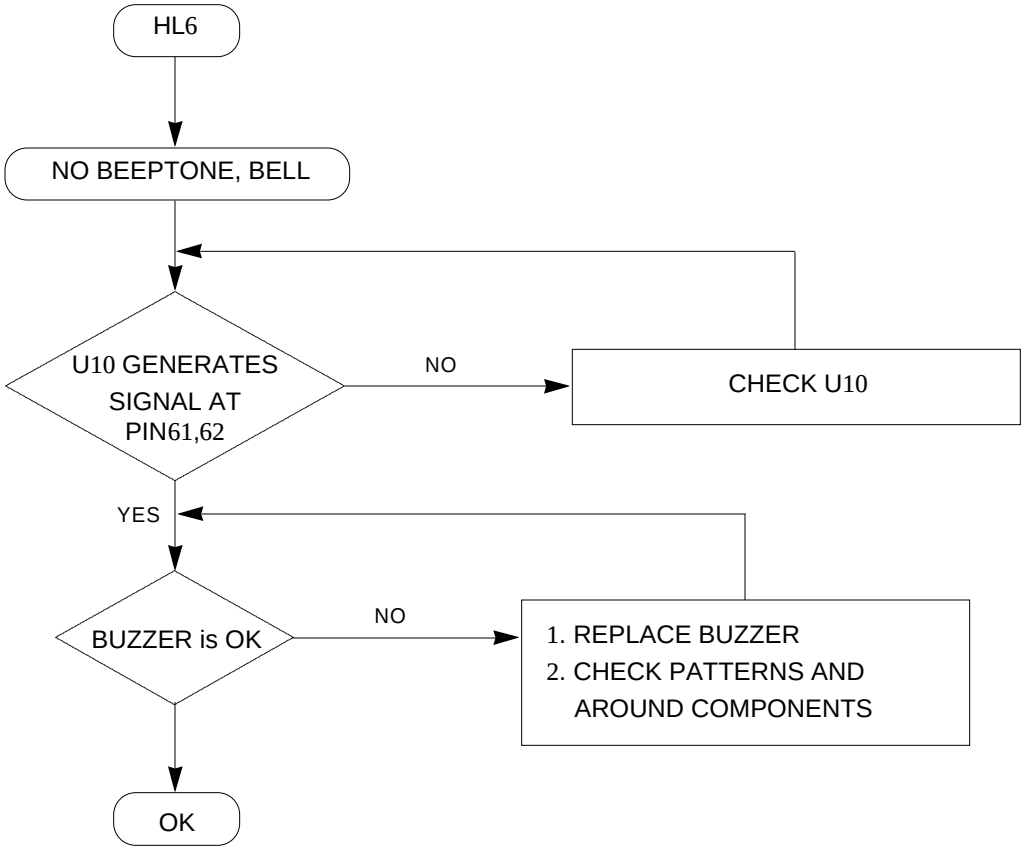
3-4. No Key Action



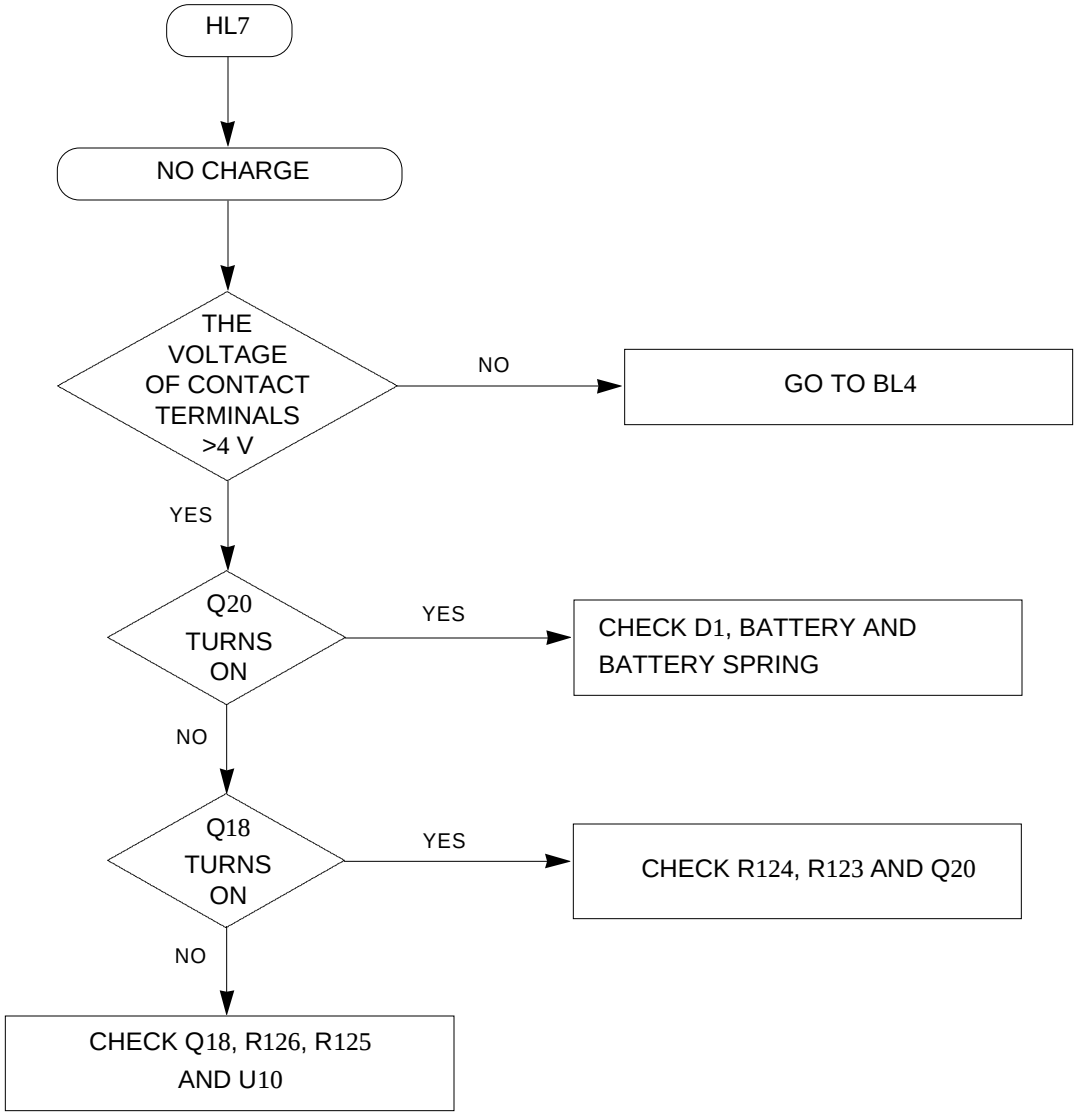
3-5. No Display



3-6. No Beeptone / No Ring

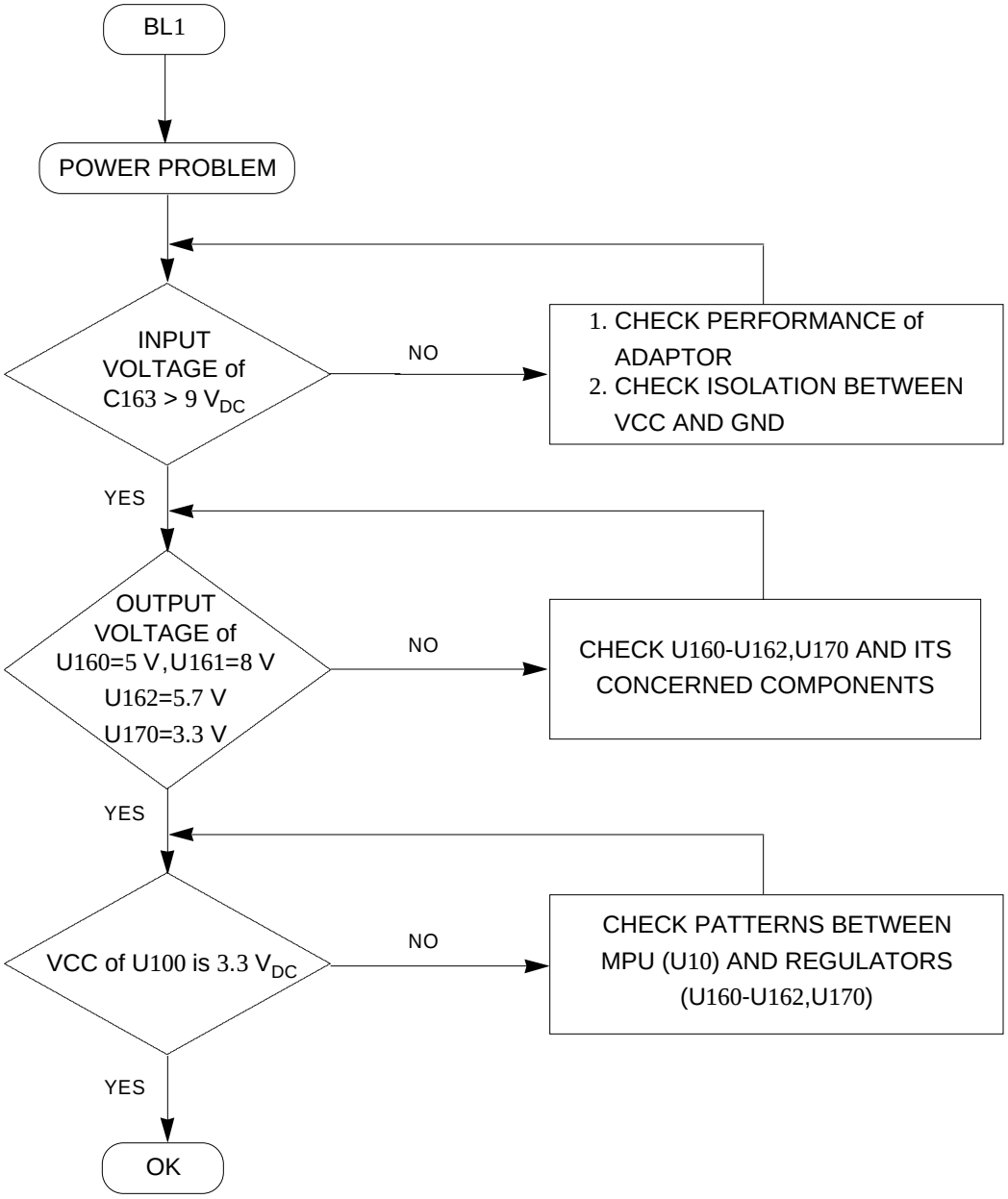


3-7. Charge Failure

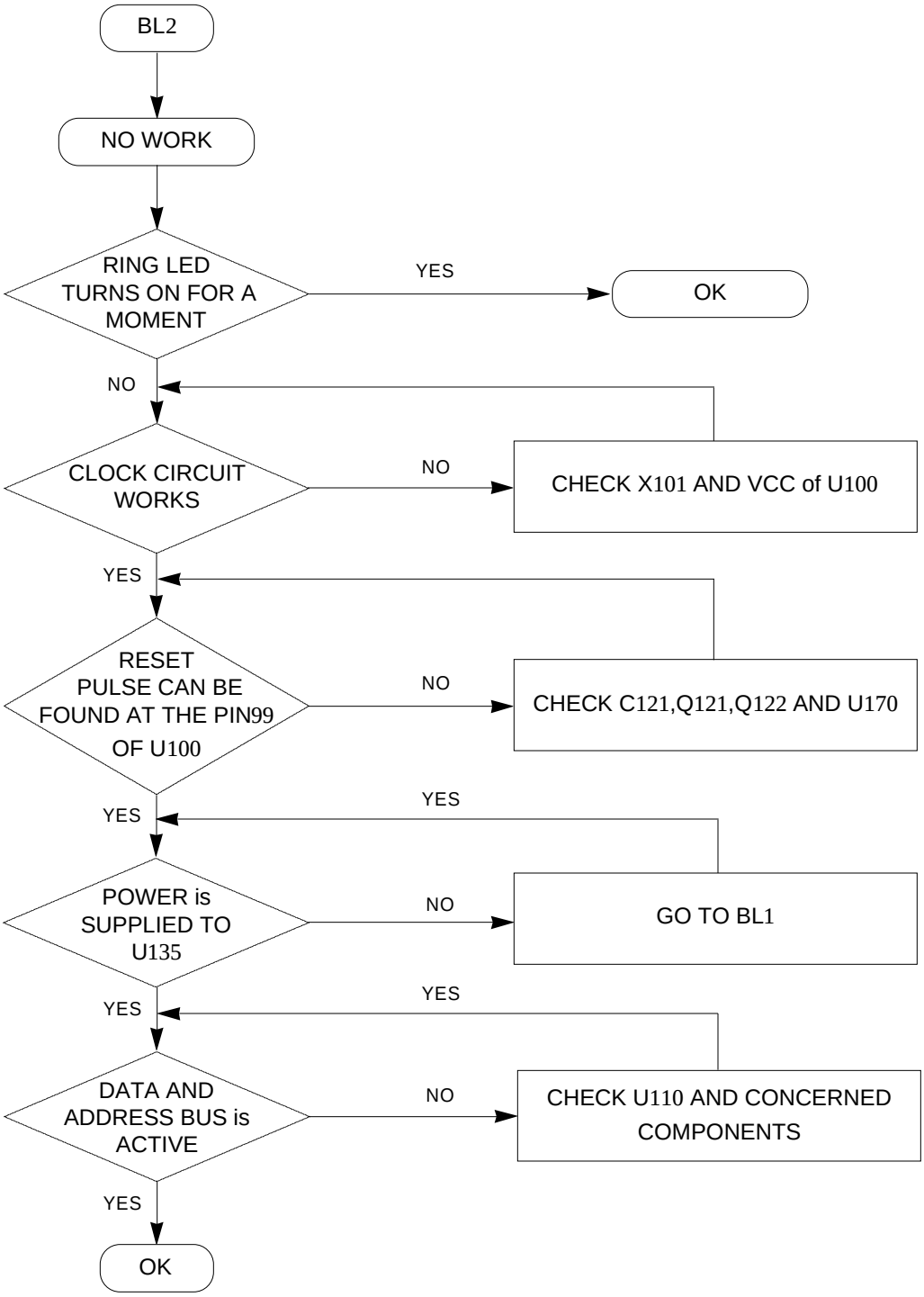


4. Trouble Shooting of Baseset Logic

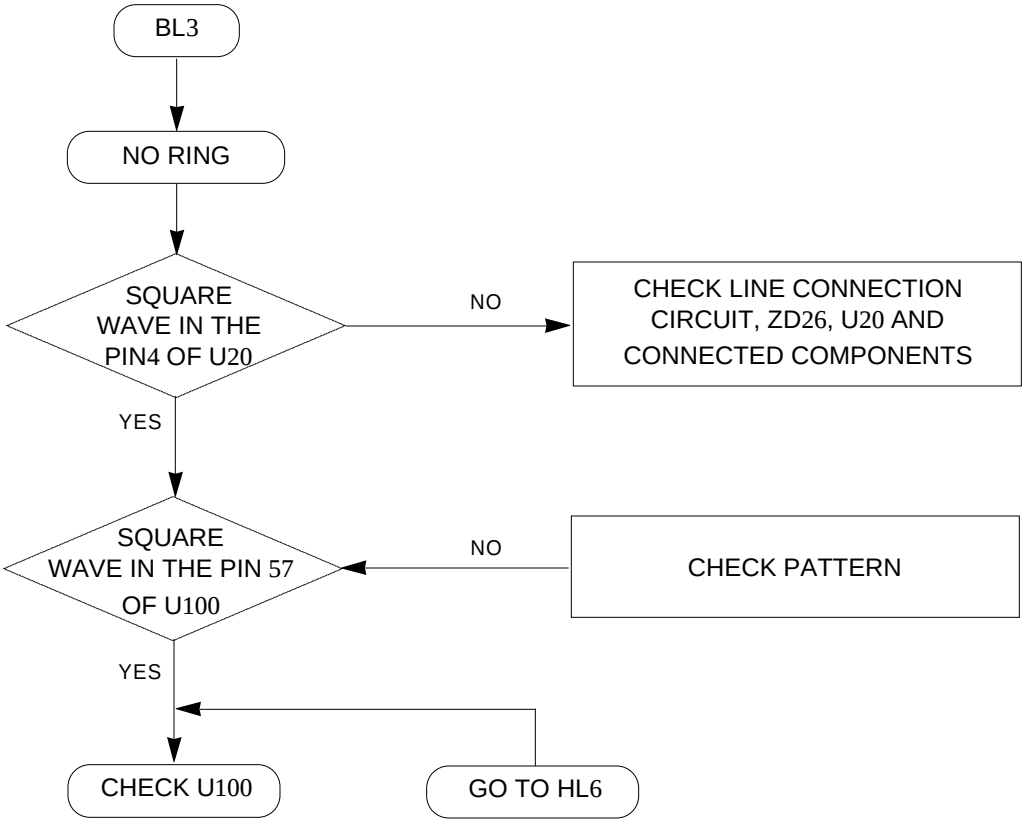
4-1. Power Problem



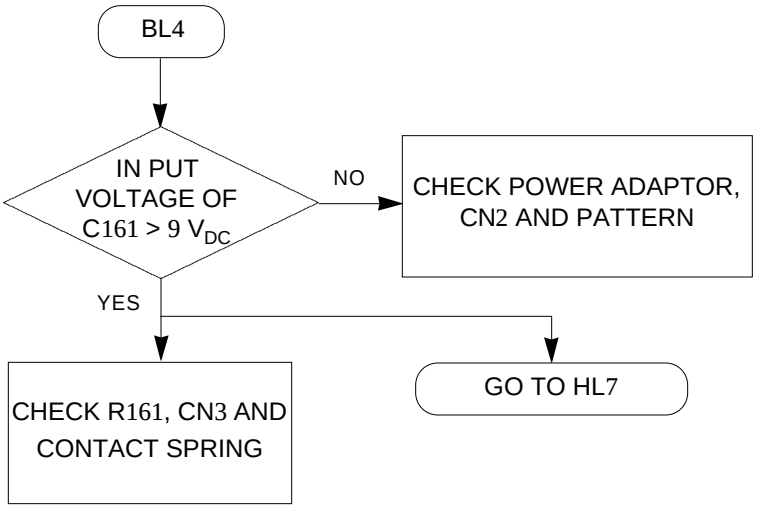
4-2. No Work


BL2
NO WORK
RING LED TURNS ON FOR A MOMENT
YES
OK
NO
CLOCK CIRCUIT WORKS
NO
CHECK X101 AND VCC of U100
YES
RESET PULSE CAN BE FOUND AT THE PIN99 OF U100
NO
CHECK C121,Q121,Q122 AND U170
YES
YES
POWER is SUPPLIED TO U135
NO
GO TO BL1
YES
YES
DATA AND ADDRESS BUS is ACTIVE
NO
CHECK U110 AND CONCERNED COMPONENTS
YES
OK

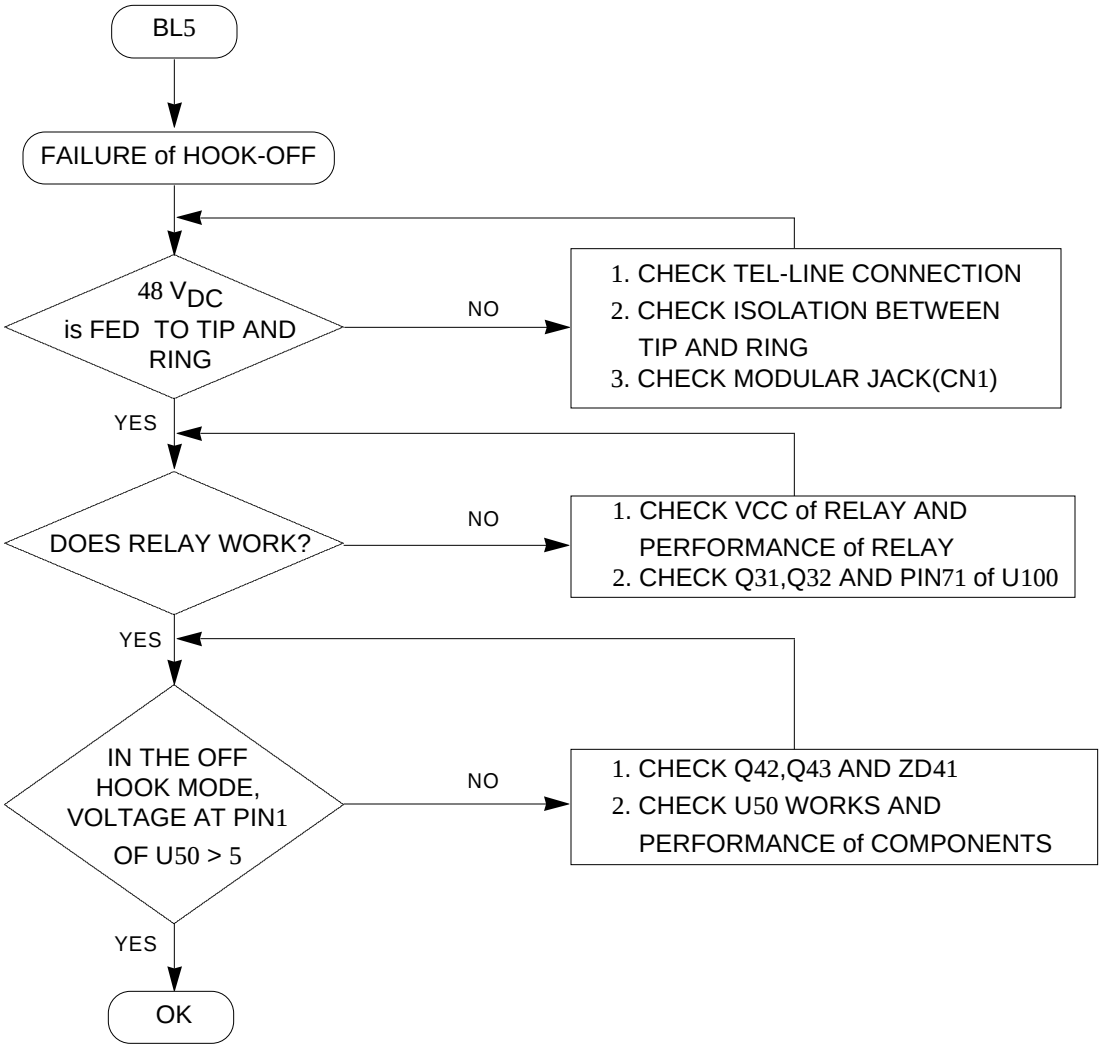
4-3. No Ring



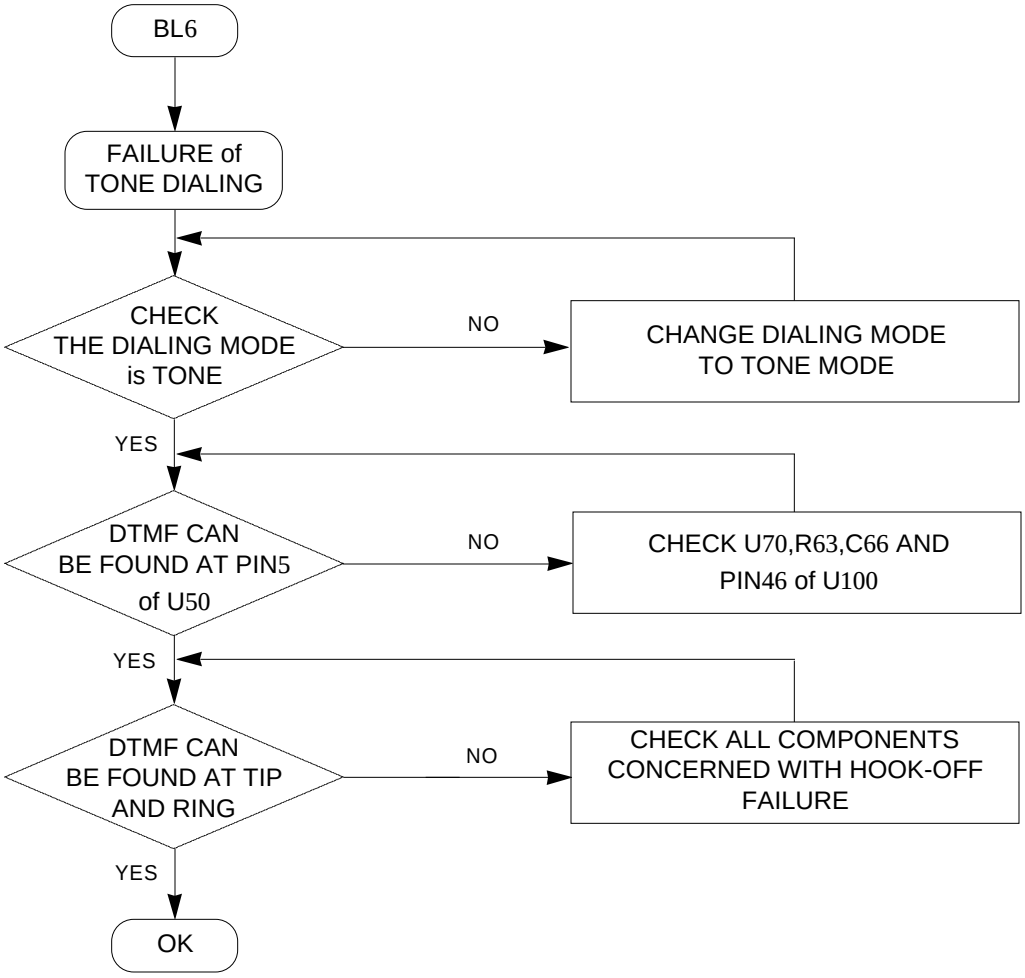
4-4. Charge Failure



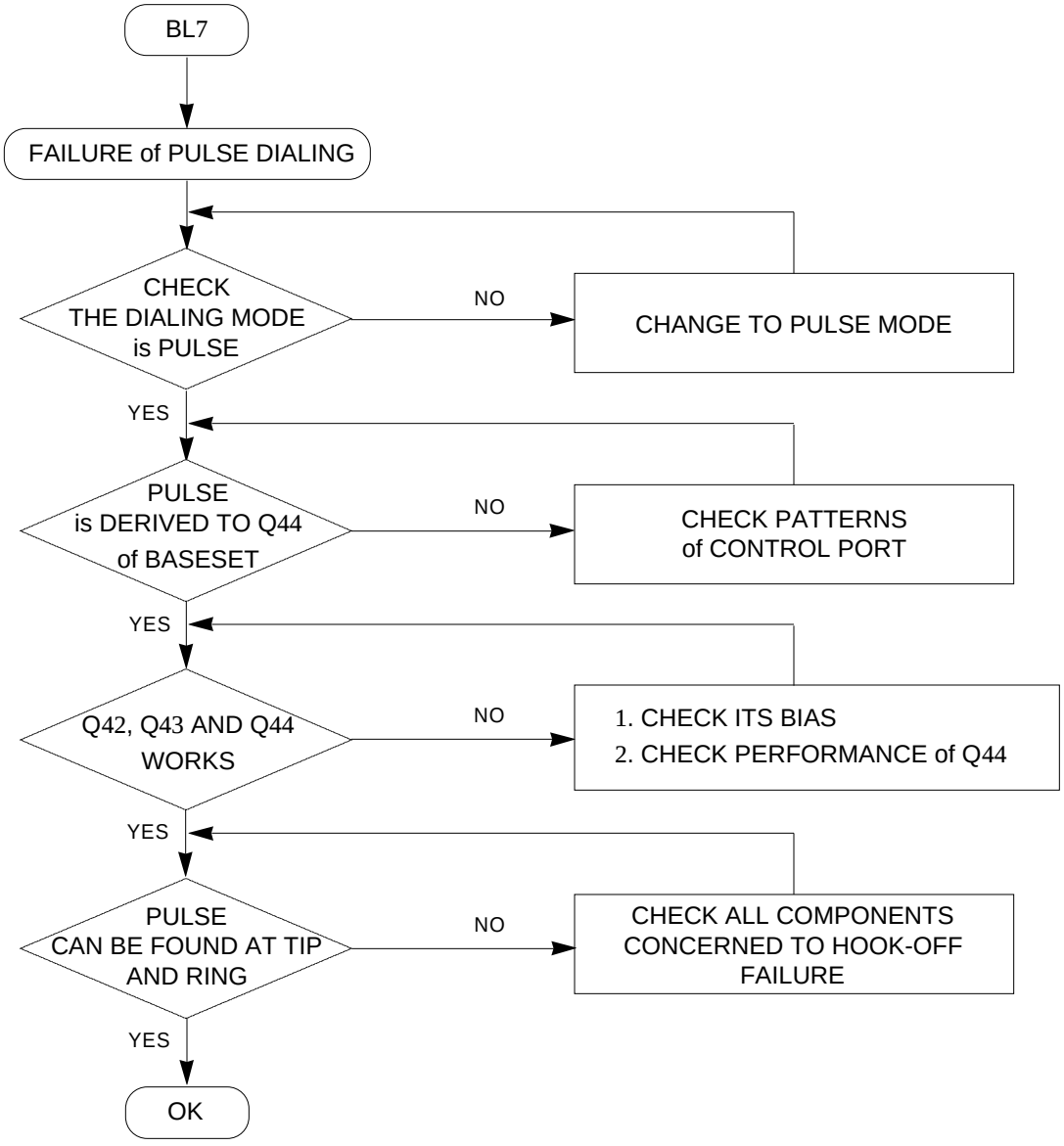
4-5. Failure of Hook-off


BL5
FAILURE of HOOK-OFF
48 V_{DC} is FED TO TIP AND RING
NO
1. CHECK TEL-LINE CONNECTION
2. CHECK ISOLATION BETWEEN TIP AND RING
3. CHECK MODULAR JACK(CN1)
YES
DOES RELAY WORK?
NO
1. CHECK VCC of RELAY AND PERFORMANCE of RELAY
2. CHECK Q31,Q32 AND PIN71 of U100
YES
IN THE OFF HOOK MODE, VOLTAGE AT PIN1 OF U50 > 5
NO
1. CHECK Q42,Q43 AND ZD41
2. CHECK U50 WORKS AND PERFORMANCE of COMPONENTS
YES
OK

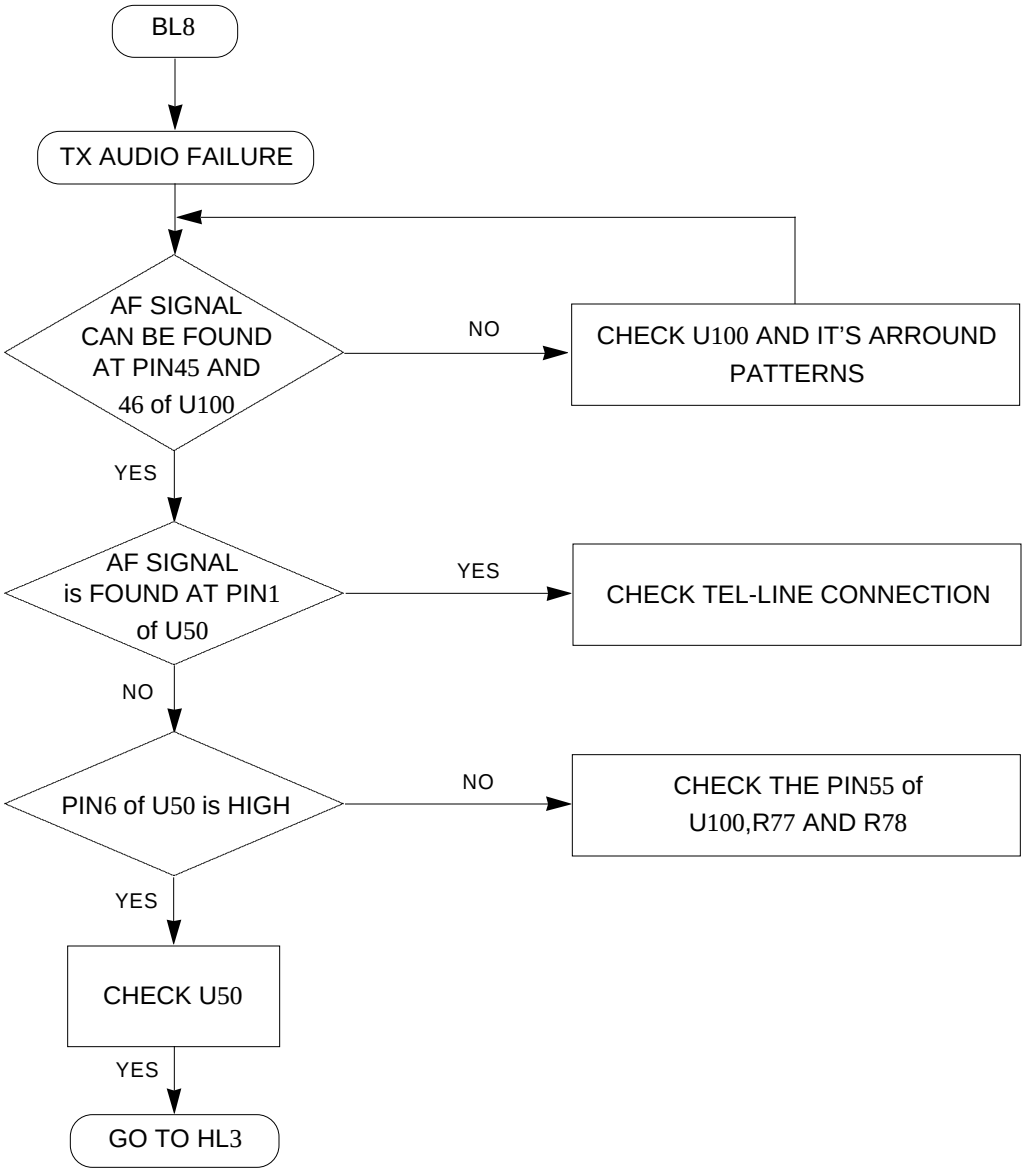
4-6. Failure of Tone Dialing



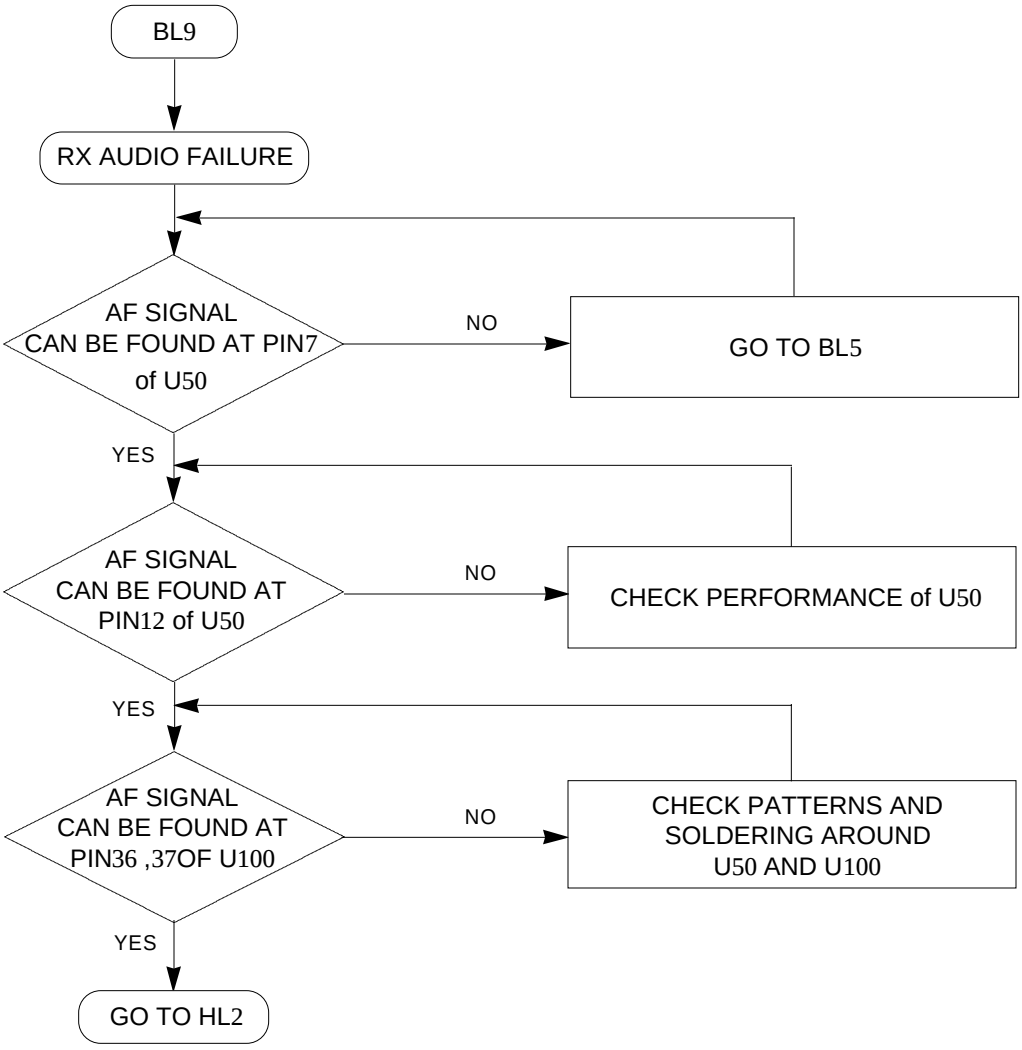
4-7. Failure of Pulse Dialing



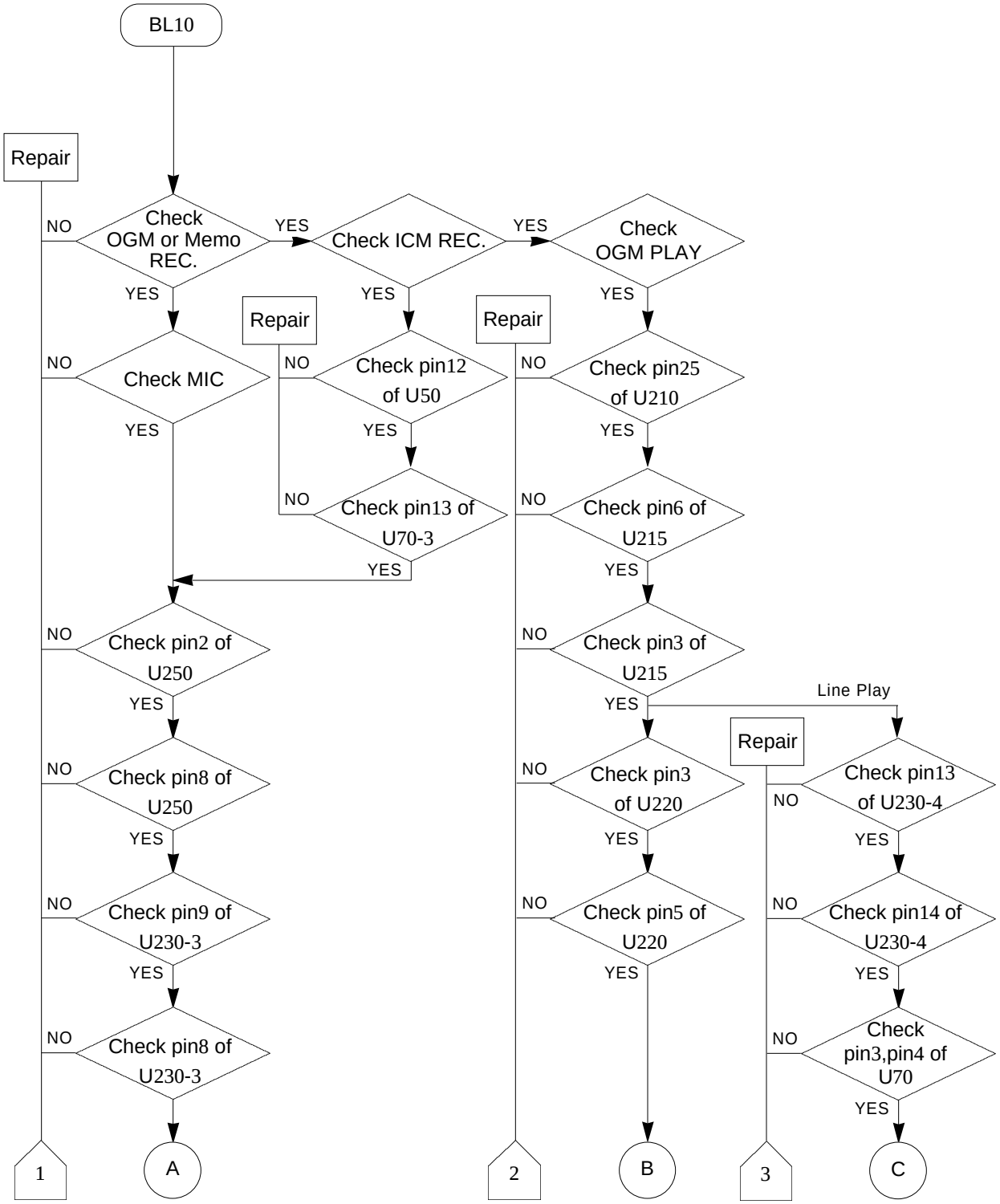
4-8. TX Audio Failure

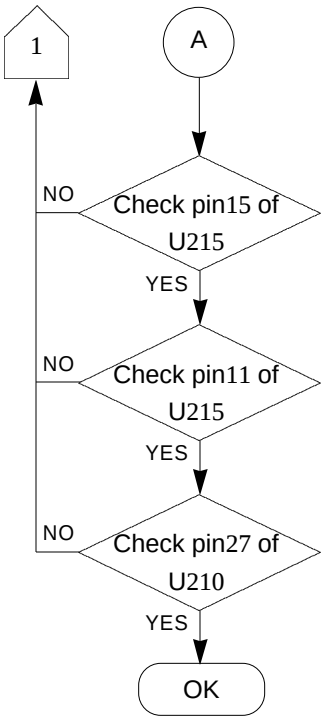


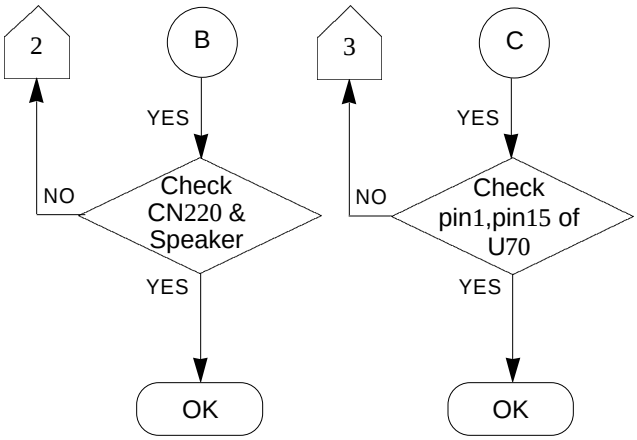
4-9. RX Audio Failure



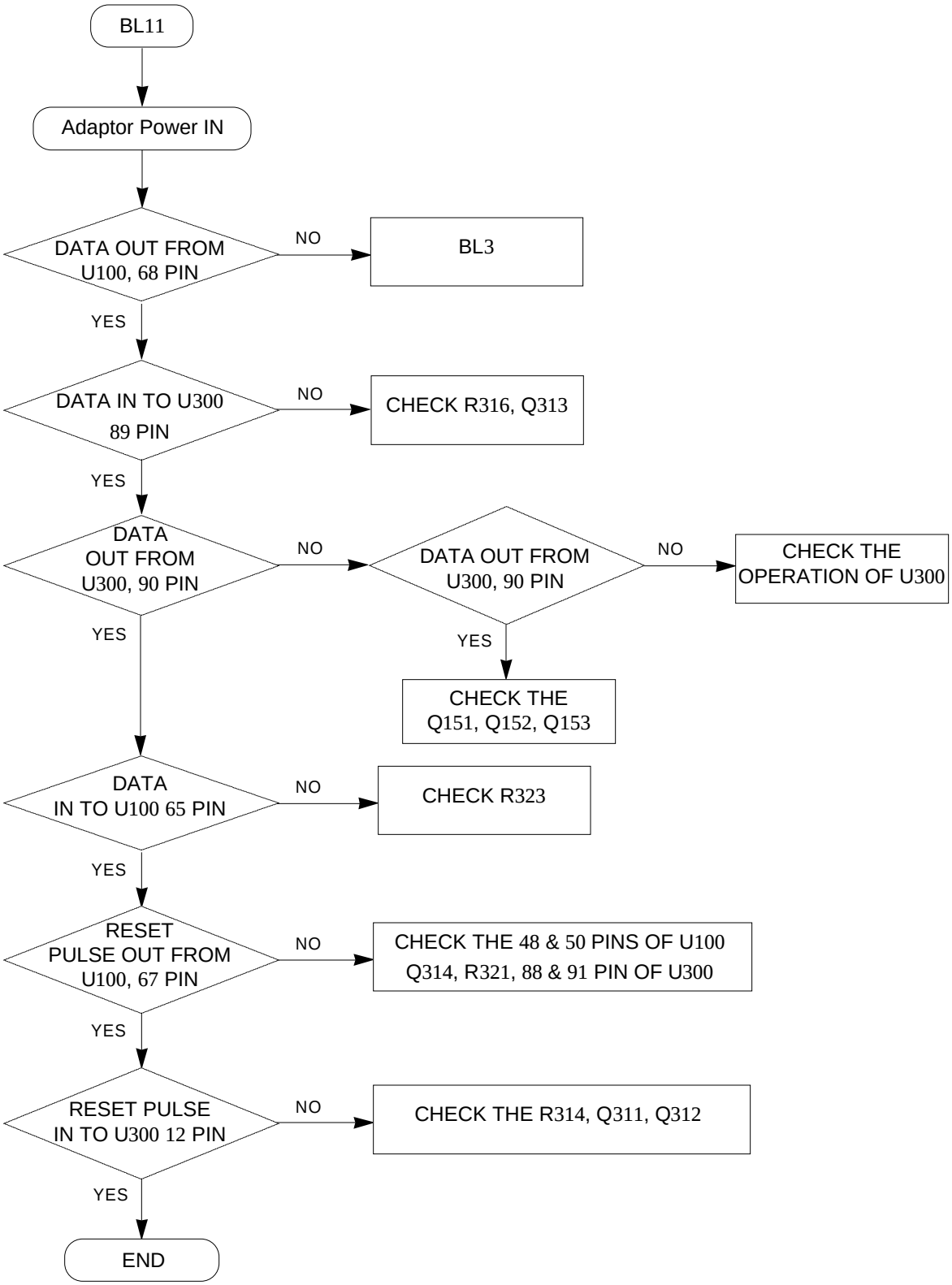
4-10. Answering Function Problem



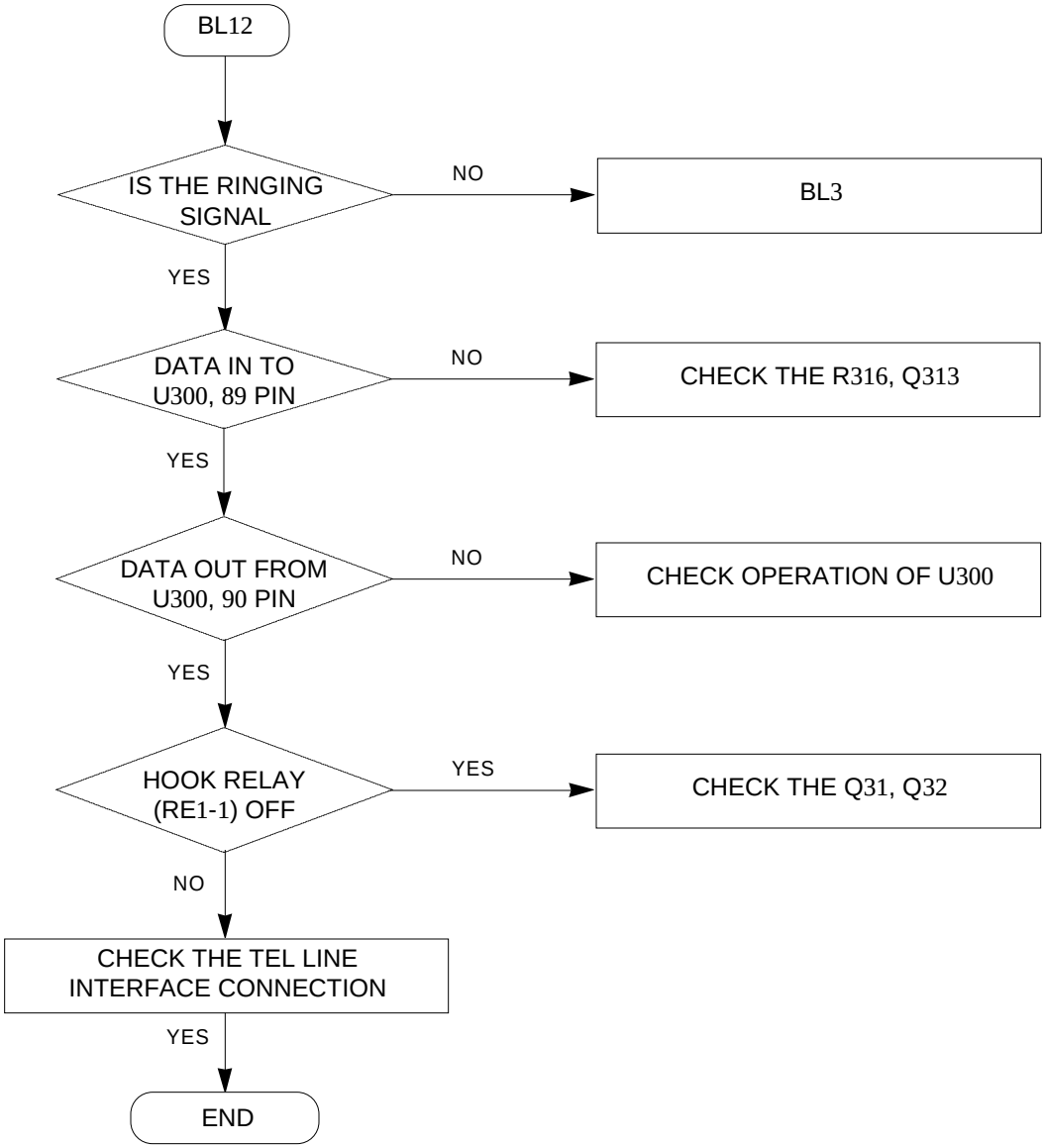

1
A
NO
Check pin15 of U215
YES
NO
Check pin11 of U215
YES
NO
Check pin27 of U210
YES
OK


2
B
YES
NO
Check CN220 & Speaker
YES
OK
3
C
YES
NO
Check pin1,pin15 of U70
YES
OK

4-11. No Reset of Answering Function Part

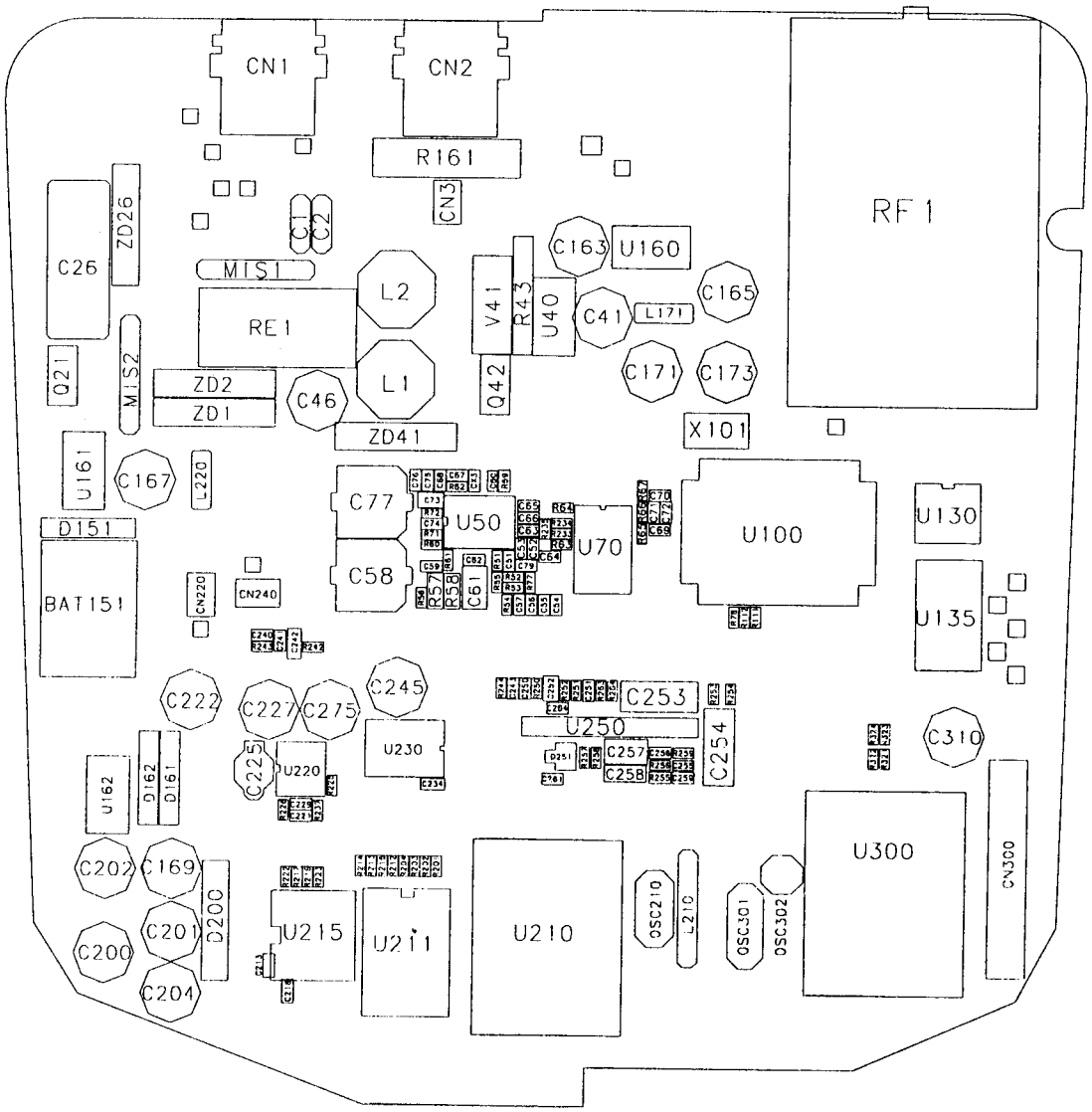


4-12. No Answering Function Operating when the ringing signal is received

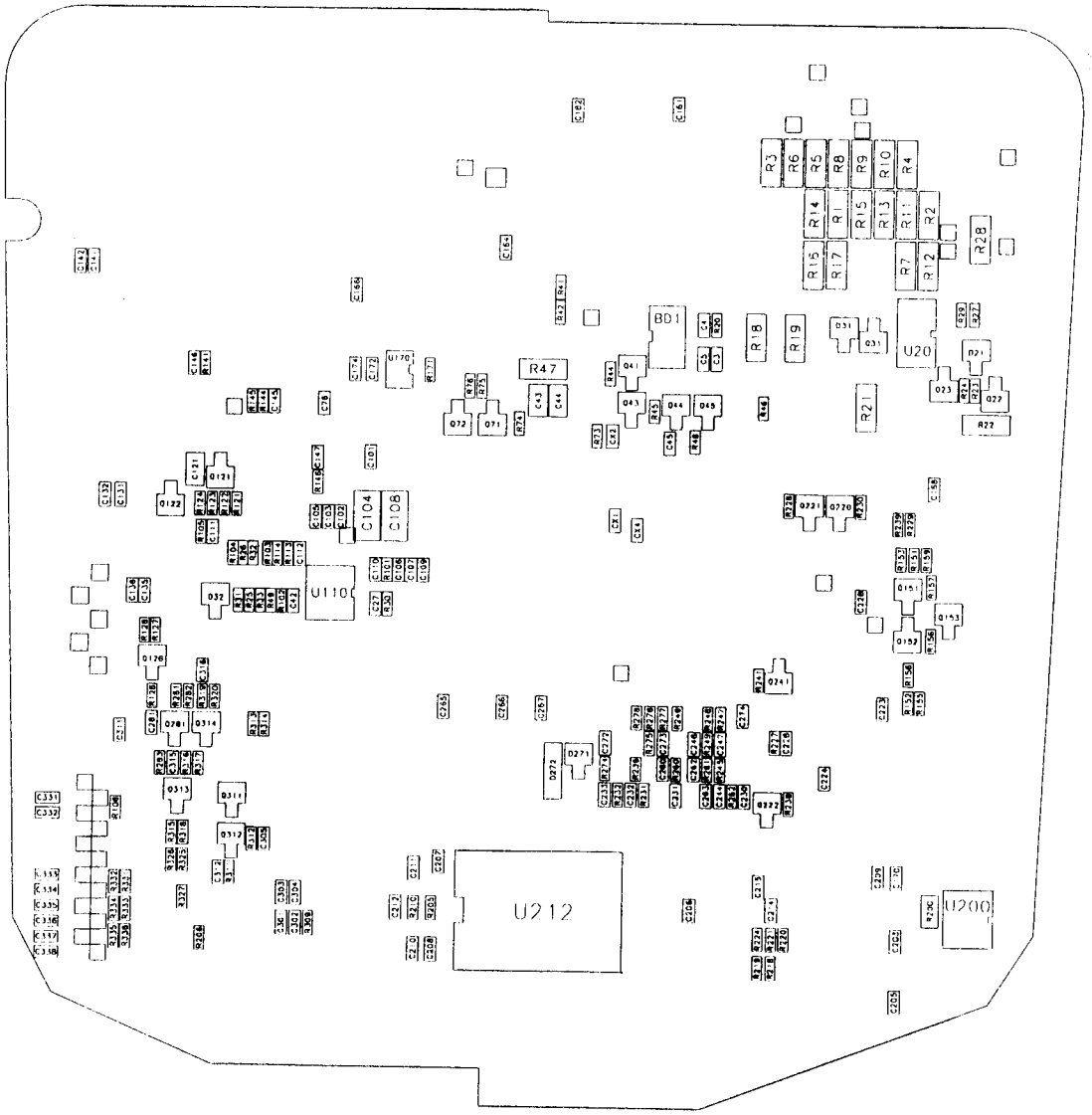


8. PCB Views

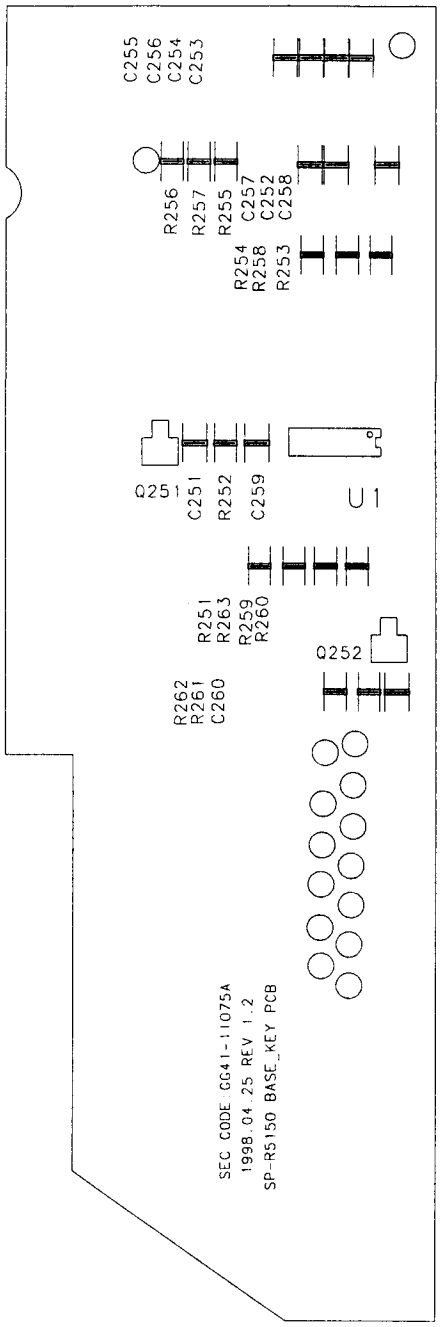
1. Base Top View



2. Base Bottom View

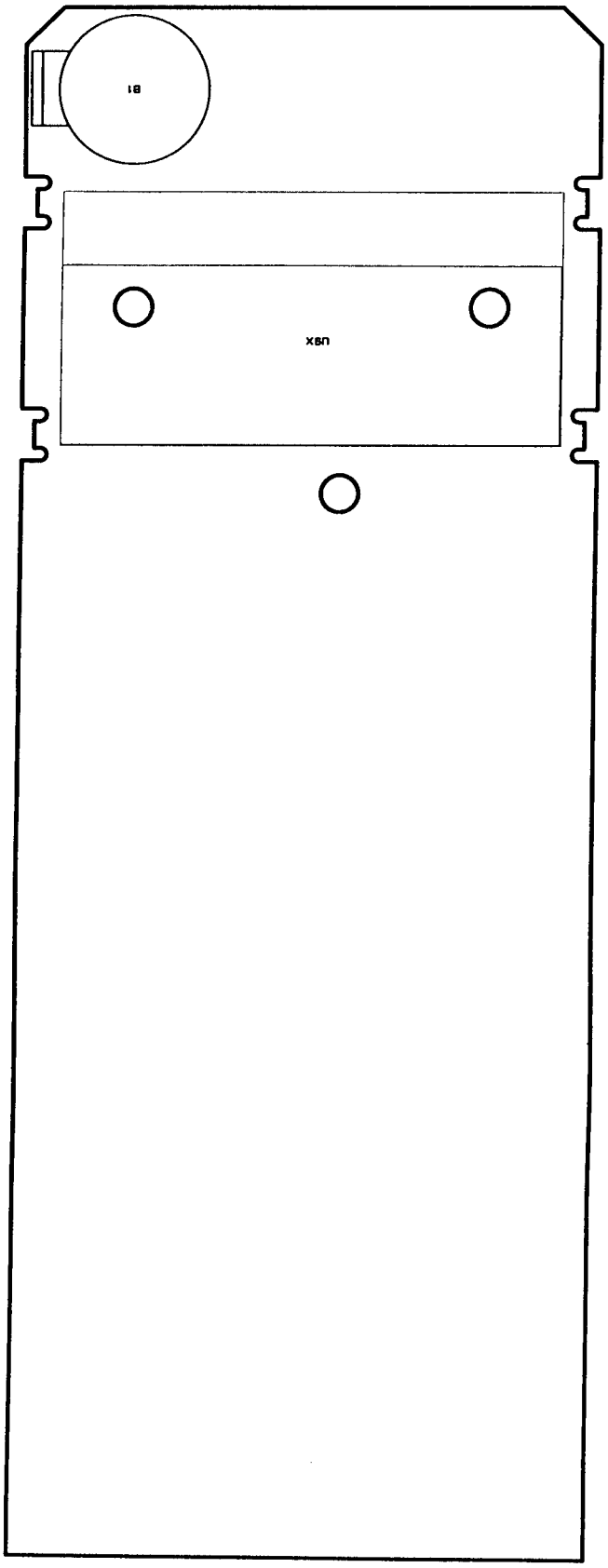


3. Base Key View

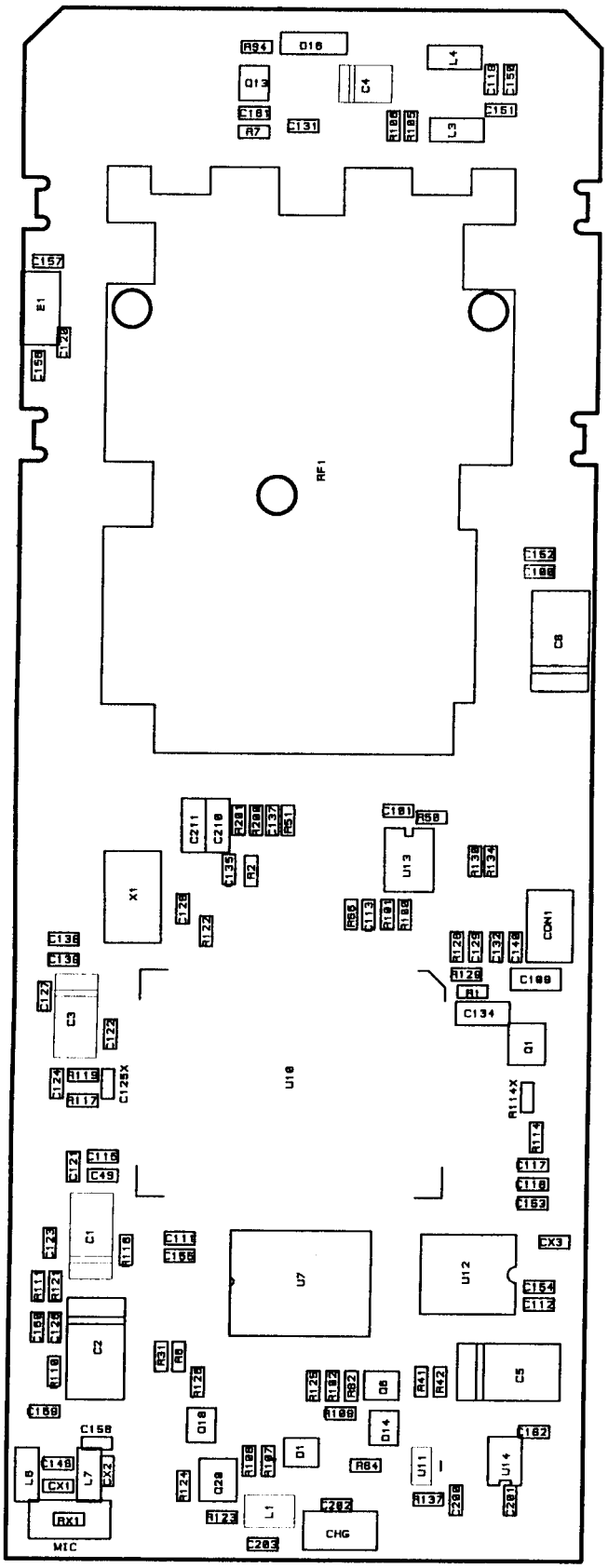


NO	Description
C251	C104Z, 100 nF, 50 V
C252	C683Z, 68 nF, 50 V
C253	C683Z, 68 nF, 50 V
C254	C683Z, 68 nF, 50 V
C255	C683Z, 68 nF, 50 V
C256	C683Z, 68 nF, 50 V
C257	C683Z, 68 nF, 50 V
C258	C683Z, 68 nF, 50 V
C259	C104Z, 100 nF, 25 V
C260	C104Z, 100 nF, 50 V
Q251	KSC1623-Y
Q252	KSC1623-Y
R251	10 kohm, 5 %
R252	10 kohm, 5 %
R253	220 ohm, 5 %
R254	220 ohm, 5 %
R255	220 ohm, 5 %
R256	220 ohm, 5 %
R257	220 ohm, 5 %
R258	220 ohm, 5 %
R259	220 ohm, 5 %
R260	10 kohm, 5 %
R261	10 kohm, 5 %
R262	100 ohm, 5 %
R263	100 ohm, 5 %
U1	MC74LS164ADR2

4. Remote Top View



5. Remote Bottom View



9. Electrical Parts List

1. Base Parts List

Location No	Description	SEC Code	Remark
	PBA MAIN-B/L SP-R5150,SEUK,UK	GG92-01237A	
Q42	TR-POWER KSA1156-O,PNP,1 W	0502-000235	
U160, U162	IC-POSI.FIXED REG. 7805,TO-220	1203-000273	
U161	IC-POSI.FIXED REG. 7808,TO-220	1203-000295	
U250	IC-EQUALIZER 2220,SIP,9P	1204-000154	
OSC302	CRYSTAL-UNIT 32.768 kHz,30 ppm	2801-001365	
OSC301	CRYSTAL-UNIT 3.579545 MHz,50 ppm	2801-001503	
OSC210	CRYSTAL-UNIT 29.4912 MHz,50 ppm	2801-001530	
RE1	RELAY-MINIATURE 5 V,200 mW,1 A	3501-000208	
CN3, CN220, CN240	CONNECTOR-HEADER BOX,2 P	3711-000827	
CN300	CONNECTOR-HEADER BOX, 13 P	3711-002814	
CN1	JACK-MODULAR 6 P/6 C, -, AU30U	3722-000250	
CN2	JACK-MODULAR 6 P/4 C, -, AUF	3722-001263	
BAT 151	BATTERY-B/L BATT 4.8 V, 15 mAH	GG43-10016A	
SMD	PRA AUTO SMD-SPR5150 SP-R5150	GG94-02406A	
D272	DIODE-SWITCHING HSK120, 60 V	0401-000128	
BD1	DIODE-BRIDGE S1ZB60, 600 V, 0.5 A	0402-000318	
D251, D271	DIODE-ARRAY KDS226,80 V, 300 mA	0407-000122	
D31	DIODE-ARRAY 1SS184, 80 V, 300 mA	0407-000123	
Q121,Q122,Q126,Q222	TR-SMALL SIGNAL KSC1623-Y, NPN	0501-000342	
Q151,Q152,Q221,Q281	TR-SMALL SIGNAL KSC1623-Y, NPN	0501-000342	
Q311,Q312,Q313,Q314	TR-SMALL SIGNAL KSC1623-Y, NPN	0501-000342	
Q31, Q32, Q44	TR-SMALL SIGNAL MMBT2222A, NPN	0501-000457	
Q153, Q220, Q241	TR-SMALL SIGNAL MMBT2907A, PNP	0501-000462	
Q43	TR-SMALL SIGNAL MMBTA92, PNP	0501-000481	
U20	PHOTO-COUPLER TR,300~600 %	0604-000138	
U130	IC-TTL 74LV573, D LATCH, SOP	0803-003023	
U300	IC-MICROCOMPUTER 6473837, 8 BIT	0903-000199	
U210	IC-DSP 6365B, 14 BIT, QFP, 80 P	0904-001157	
U70	IC-ANALOG SWITCH GD4053BDT	1001-000127	
U135	IC-EPROM 27LV512, 64 K x 8 BIT, SOP	1102-001022	
U212	IC-EPROM 27C4000, 120 K x 8 BIT	1102-001086	
U110	IC-EEPROM 24LC04B, 4 K x 8 BIT	1103-001096	

Location No	Description	SEC Code	Remark
U211	IC-AUDIO RAM 44C4100, 1 M X 4 BIT	1109-001073	
U220	IC-AUDIO AMP 386, SOP, 8 P, 150 MIL	1201-000114	
U230	IC-OP AMP 324, SOP, 14 P, 150 MIL	1201-000227	
U200	IC-POSI.FIXED REG. 7660, SOP, 8 P	1203-000269	
U170	IC-VOLTAGE REGULATOR 1R33, SOP	1203-001390	
U215	IC-CODEC TP3054WMX, SOP, 16 P	1205-000120	
U50	IC-TRANSMITTER TEA1118AT, SOP	1205-001166	
U100	IC-DEC PCD5092H/C26/F5, QFP, 100 P	1205-001471	
R3, R8, R12, R16	R-CHIP 0 ohm, 5 %, 1/8 W	2007-000033	
R41, R42, C4	R-CHIP 0 ohm, 5 %, 1/16 W	2007-000070	
R203, R204	R-CHIP 22 ohm, 5 %, 1/16 W	2007-000071	
R212~215, R253	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000074	
R145	R-CHIP 220 ohm, 5 %, 1/16 W	2007-000075	
R126	R-CHIP 330 ohm, 5 %, 1/16 W	2007-000076	
R55, R71	R-CHIP 470 ohm, 5 %, 1/16 W	2007-000077	
R331~R336	R-CHIP 1 kohm, 5 %, 1/16 W	2007-000078	
R77, R106, R314	R-CHIP 1 kohm, 5 %, 1/16 W	2007-000078	
R222	R-CHIP 1.8 kohm, 5 %, 1/16 W	2007-000079	
R66, R234	R-CHIP 2.7 kohm, 5 %, 1/16 W	2007-000081	
R156	R-CHIP 3.3 kohm, 5 %, 1/16 W	2007-000082	
R317,R320,R33,R111	R-CHIP 4.7 kohm, 5 %, 1/16 W	2007-000084	
R112,R78,R102,R103	R-CHIP 4.7 kohm, 5 %, 1/16 W	2007-000084	
R228	R-CHIP 4.7 kohm, 5 %, 1/16 W	2007-000084	
R155,R159,R224,R276	R-CHIP 5.6 kohm, 5 %, 1/16 W	2007-000086	
R242~244	R-CHIP 6.8 kohm, 5 %, 1/16 W	2007-000087	
R113,R127,R144,R319	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000090	
R217,R230,R311,R312	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000090	
R238,R245,R252,R313	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000090	
R29,R31,R32,R46,R316	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000090	
R61,R206,R216,R260	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000090	
R152, R231, R254	R-CHIP 12 kohm, 5 %, 1/16 W	2007-000091	
R153, R282	R-CHIP 15 kohm, 5 %, 1/16 W	2007-000092	
R158, R205, R256	R-CHIP 20 kohm, 5 %, 1/16 W	2007-000093	
R225	R-CHIP 22 kohm, 5 %, 1/16 W	2007-000094	
R30	R-CHIP 30 kohm, 5 %, 1/16 W	2007-000096	
R122,R141,R171,R229	R-CHIP 47 kohm, 5 %, 1/16 W	2007-000097	
R283,R250,R315,R318	R-CHIP 47 kohm, 5 %, 1/16 W	2007-000097	

Location No	Description	SEC Code	Remark
R76, R105, R121	R-CHIP 47 kohm, 5 %, 1/16 W	2007-000097	
R45, R241, R255	R-CHIP 56 kohm, 5 %, 1/16 W	2007-000098	
R248	R-CHIP 68 kohm, 5 %, 1/16 W	2007-000100	
R123,R201,R246,R247	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000102	
R281R325,R326,R327	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000102	
R151, R251	R-CHIP 150 kohm, 5 %, 1/16 W	2007-000104	
R210, R309	R-CHIP 1 Mohm, 5 %, 1/16 W	2007-000109	
R219,R221	R-CHIP 390 ohm, 5 %, 1/16 W	2007-000118	
R239	R-CHIP 820 ohm, 5 %, 1/16 W	2007-000121	
R220, R263, R274	R-CHIP 1.2 kohm, 5 %, 1/16 W	2007-000122	
R223, R236, R262	R-CHIP 1.2 kohm, 5 %, 1/16 W	2007-000122	
R54,R67,R235	R-CHIP 1.5 kohm, 5 %, 1/16 W	2007-000123	
R257	R-CHIP 2.2 kohm, 5 %, 1/16 W	2007-000124	
R63, R64	R-CHIP 3.9 kohm, 5 %, 1/16 W	2007-000125	
R232	R-CHIP 180 kohm, 5 %, 1/16 W	2007-000132	
R44	R-CHIP 330 kohm, 5 %, 1/16 W	2007-000133	
R258	R-CHIP 300 kohm, 5 %, 1/16 W	2007-000136	
R321,R323	R-CHIP 1.1 kohm, 5 %, 1/16 W	2007-000211	
R101, R227, R240	R-CHIP 10 ohm, 5 %, 1/16 W	2007-000309	
R51	R-CHIP 130 kohm, 5 %, 1/16 W	2007-000368	
R53	R-CHIP 180 ohm, 5 %, 1/16 W	2007-000450	
R264,R322,R324,R52	R-CHIP 2.4 kohm, 5 %, 1/16 W	2007-000512	
R124, R226	R-CHIP 24 kohm, 5 %, 1/16 W	2007-000616	
R277, R278	R-CHIP 270 kohm, 5 %, 1/16 W	2007-000637	
R218	R-CHIP 300 ohm, 5 %, 1/16 W	2007-000729	
R28	R-CHIP 33 kohm, 5 %, 1/8 W	2007-000777	
R259	R-CHIP 36 kohm, 5 %, 1/16 W	2007-000805	
R56	R-CHIP 39 ohm, 5 %, 1/16 W	2007-000839	
R58	R-CHIP 39 ohm, 5 %, 1/8 W	2007-000840	
R57	R-CHIP 47 ohm, 5 %, 1/8 W	2007-000950	
R72, R146	R-CHIP 510 ohm, 5 %, 1/16 W	2007-001002	
R200	R-CHIP 56 ohm, 5 %, 1/10 W	2007-001043	
R202	R-CHIP 68 ohm, 5 %, 1/16 W	2007-001134	
R65, R233	R-CHIP 750 ohm, 5 %, 1/16 W	2007-001157	
R275	R-CHIP 75 kohm, 5 %, 1/16 W	2007-001161	
R237	R-CHIP 8.2 kohm, 5 %, 1/16 W	2007-001179	
R249	R-CHIP 82 kohm, 5 %, 1/16 W	2007-001210	

Location No	Description	SEC Code	Remark
C107,C110,C112,C132	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C136,C142,C164,C166	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C168,C216,C170,C174	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C205~C207,C213,C214	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C223,C215,C224,C231	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C233,C251,C263,C256	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C305,C272,C274,C311	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C312	C-CERAMIC, CHIP 100 nF, +80-20 %, 25 V	2203-000189	
C51,C63,C65,C66,C69	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000236	
C70,C78,C103,C105	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000236	
C67,C109	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000236	
C208,C209,C241,C243	C-CERAMIC, CHIP 10 nF, 10 %, 50 V	2203-000257	
C255,C281,C331,C332	C-CERAMIC, CHIP 10 nF, 10 %, 50 V	2203-000257	
C42,C145,C172	C-CERAMIC, CHIP 10 nF, 10 %, 50 V	2203-000257	
C141, C146, C203	C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V	2203-000280	
C211, C212	C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V	2203-000280	
C301, C302	C-CERAMIC, CHIP 12 pF, 5 %, 50 V	2203-000332	
C27, C56	C-CERAMIC, CHIP 15 nF, 10 %, 50 V	2203-000372	
C303, C304	C-CERAMIC, CHIP 15 pF, 5 %, 50 V	2203-000384	
C210	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000440	
C121, C252	C-CERAMIC, CHIP 1 uF, +80-20 %, 16 V	2203-000476	
C316,C262,C68,C71	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V	2203-000491	
C76,C315	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V	2203-000491	
C232,C246,C333~C338	C-CERAMIC, CHIP 220 pF, 5 %, 50 V	2203-000592	
C101	C-CERAMIC, CHIP 22 pF, 2 %, 50 V	2203-000624	
C259	C-CERAMIC, CHIP 30 pF, 5 %, 50 V	2203-000744	
C161, C162, C226	C-CERAMIC, CHIP 33 nF, 10 %, 16 V	2203-000799	
C147, C221	C-CERAMIC, CHIP 4.7 nF, 10 %, 50 V	2203-000888	
C54, C260, C273	C-CERAMIC, CHIP 47 nF, 10 %, 16 V	2203-000972	
C250	C-CERAMIC, CHIP 56 nF, 10 %, 16 V	2203-001063	
C102,C106,C111,C230	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	
C131,C135,C228,C229	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	
C234,C240,C247,CX3	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	
C239,C267,C264,C265	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	
C266,C52,C53,C59	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	
C60,C62,C72,C75,C79	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	
CX1,CX2,CX4	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 100 V	2203-001109	

Location No	Description	SEC Code	Remark
C55,C57,C261	C-CERAMIC, CHIP 220 nF, +80-20 %, 16V	2203-001402	
C244	C-CERAMIC, CHIP 68 nF, 20 %, 50 V	2203-002123	
C73	C-CERAMIC, CHIP 470 nF, 10 %, 16 V	2203-002494	
C58, C77	C-AL, SMD 100 uF, 20 %, 16 V	2402-001042	
C257	C-TA, CHIP 22 uF, 20 %, 6.3 V	2404-000198	
C258	C-TA, CHIP 4.7 uF, 20 %, 10 V	2404-000232	
C253, C254	C-TA, CHIP 47 uF, 20 %, 6.3 V	2404-000260	
C61	C-TA, CHIP 10 uF, 20 %, 16 V	2404-000284	
C104, C108	C-TA, CHIP 33 uF, 20 %, 6.3 V	2404-001032	
C242	C-TA, CHIP 10 uF, 20 %, 6.3 V	2404-001064	
X101	CRYSTAL-SMD 13.824 MHz, 10 ppm	2801-003596	
PCB	PCB-SPR5150 SP-R5150,FR-4,2L	GG41-11074A	
AUTO	PRA AUTO-SPR5150 SP-R5150	GG94-02407A	
AXI	PRA AUTO AXL-B/L SP-R5150	GG94-02414A	
D151, D161, D162	DIODE-SWITCHING 1N4148, 100 V	0401-000140	
D200	DIODE-RECTIFIER 1N4004, 400 V	0402-000345	
ZD26	DIODE-ZENER 1N4728A, 3.3 V, 5 %, 1 W	0403-000131	
ZD41	DIODE-TVS BZW06-13, 14.3/15/15.8 V	0406-000117	
R161	R-METAL OXIDE 68 ohm, 5 %, 1 W	2003-000358	
L210	INDUCTOR-AXIAL 3.3 uH, 10 %	2701-000236	
C26	WIRE-NO SHEATH CU SDACW	3812-000101	
MIS1	SURGE ABSORBER 300 V, 15 %	4715-000127	
RAD	PRA AUTO RAL-B/L SP-R5150	GG94-02415A	
V41	VARISTOR 120 V, 2500A, 11.5 x 4.2 mm	1405-000105	
C1, C2	C-CERAMIC, DISC 470 pF, 20 %, 400 V	2201-000560	
C167,C227,C169,C171	C-AL 100 uF, 20 %, 16 V	2401-000042	
C222	C-AL 100 uF, 20 %, 16 V	2401-000042	
C201,C204,C245,C310	C-AL 100 uF, 20 %, 10 V	2401-000250	
C163	C-AL 100 uF, 20 %, 25 V	2401-000308	
C225	C-AL 10 uF, 20 %, 16 V	2401-000414	
C173	C-AL 220 uF, 20 %, 6.3 V	2401-000883	
C275	C-AL 47 uF, 20 %, 16 V	2401-001509	
C200, C202	C-AL 47 uF, 20 %, 10 V	2401-001786	
C165	C-AL 1000 uF, 20 %, 6.3 V	2401-002485	
L171,L220	INDUCTOR-RADIAL 33 uH, 10 %	2702-001007	
RF1	ELA UNIT-B/L SP-R5100, SEUK	GG96-01089A	
L1	COIL RF SF2600,4 mH,7.5 ohm	JF27-30053A	

2. Difference table for each country Base Parts List

LIME CONN

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
R6	X	O	O				X	
R2	X	X	X				X	
R5	X	X	X				O	
R4	X	X	O				X	
R3	O	X	X				O	
R10	X	X	O				O	
R13	X	X	X				X	
R9	X	X	O				X	
R11	X	X	X				X	
R1	X	X	X				O	
R8	O	O	X				X	
R7	X	X	O				X	
R15	X	O	X				O	
R17	X	X	O				X	
R12	O	X	X				X	
R18	X	X	X				X	
R19	X	X	O				X	
R20	X	O	X				O	
R16	O	X	X				X	
V41	9DK121	9DK121	9DK121				9DK121	
CN1	6P/6C	6P/4C	6P/4C				6P/6C	

METE RING PULSE

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C3	X	X	X				O	
C5	X	X	X				4.7 nF	
C4	O	X	O				22 nF	
L2	X	4 mH	X				4 mH	
L1	4 mH	4 mH	4 mH				X	

SHUNT

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
R21	X	X	X				X	
ZD1	X	X	X				X	
ZD2	X	X	X				X	

LIMIT

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C41	X	10 uF/50 V	X				X	
Q41	X	X	X				X	
R42	O	X	O				O	
R41	O	X	O				O	
R43	X	22 1/4 W	X				X	
U40	X	LM317	X				X	

AUX DETECT

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
R73	X	X	1.5 Mohm				X	
R74	X	X	1.5 Mohm				X	
R75	X	X	220 kohm				X	
Q71	X	X	2222A				X	
Q72	X	X	2222A				X	

DTMF

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C64	X	10 nF	X				10 nF	

EARTH

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
Q21	X	X	X				1156A	
Q23	X	X	X				2222A	
Q22	X	X	X				A92	
D21	X	X	X				KDS184	
Ms2	X	X	X				SA301	
R22	X	X	X				O	
R23	X	X	X				330 kohm	
R24	X	X	X				56 kohm	
R25	X	X	X				10 kohm	
R26	X	X	X				4.7 kohm	

PULSE E/SHAPE E/MASK

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C43	X	X	X				X	
C44	X	X	X				X	
C46	X	22 uF	22 uF/6.3 V				X	
Q45	X	2222A	2222A				2222A	
R47	X	X	X				X	
R48	X	180 ohm	120 ohm				300 ohm	
R49	X	10 kohm	1.2 kohm				1.2 kohm	

RING DETECT

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C26	JUMPER	0.47 uF/250 V	0.9 uF/250 V				0.47 uF/250 V	
C27	15 nF	15 nF	15 nF				15 nF	
R27	X	X	X				15 kohm	
R28	33 kohm	56 kohm	43 kohm				30 kohm	
R29	10 kohm	10 kohm	10 kohm				10 kohm	
R30	30 kohm	30 kohm	30 kohm				30 kohm	

STMR

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C54	47 nF	47 nF	470 nF				33 nF	
C55	220 nF	100 nF	470 nF				100 nF	
C56	15 nF	100 nF	X				100 nF	
C57	220 nF	100 nF	X				100 nF	
R52	2.4 kohm	2.4 kohm	2 kohm				3.6 kohm	
R55	470 ohm	470 ohm	470 ohm				470 ohm	
R53	180 ohm	110 ohm	180 ohm				100 ohm	
R54	1.5 kohm	270 ohm	180 ohm				750 ohm	

R/L

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C74	NC	220 nF	X				27 nF	
C73	470 nF	X	47 nF				100 nF	
R71	470 ohm	510 ohm	560 ohm				220 ohm	
R72	510 ohm	270 ohm	68 ohm				750 ohm	

SLR

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C66	100 nF	100 nF	100 nF				100 nF	
C65	100 nF	100 nF	100 nF				100 nF	
R63	3.9 kohm	3.9 kohm	3.9 kohm				3.9 kohm	
R64	3.9 kohm	3.9 kohm	3.9 kohm				3.9 kohm	

RLR/NOISE

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C51	100 nF	100 nF	100 nF				100 nF	
C67	100 pF	100 pF	220 pF				100 pF	
R51	130 kohm	130 kohm	120 kohm				130 kohm	
R62	X	X	X				X	
R66	2.7 kohm	1 kohm	2.7 kohm				2.7 kohm	

AGC/DCR/SLPE

May 21, 1998

Country / Circuit No.	VERSION UP COUNTRY							
	UK	FRA	ITY	ASTR	NET	RUS	GER	Remark
C61	10 uF/16 V	4.7 uF/10 V	4.7 uF/10 V				4.7 uF/10 V	
C58	100 uF/16 V	X	100 uF/16 V				X	
R60	X	X	X				X	
R61	10 kohm	X	X				15 kohm	
R59	X	47 kohm	100 kohm				X	
R56	39 ohm	X	39 ohm				X	
R57	47 1/8 W	47 1/8 W	100 1/8 W				47 1/8 W	
R58	39 1/8 W	39 1/8 W	100 1/8 W				39 1/8 W	

3. Remote Parts List

Location No	Description	SEC Code	Remark
LCD	DISPLAY LCD SP-R5100	GG07-20530A	
CBF1	CBF HARNESS-R/BATT : SP-R5100	GG39-41051A	
CBF2(MIC)	CBF HARNESS-R/MIC : SP-R5100	GG39-41052A	
CBF3(MIC)	CBF HARNESS-R/MIC : SP-R5100	GG39-41053A	
CBF4	CBF HARNESS-CHG : SP-R5100	GG39-41054A	
CBF5	CBF HARNESS-CHG : SP-R5100	GG39-41055A	
LCD	PMO-LCD HOLDER : SP-R5100	GG72-42560A	
R/M SMD	PRA AUTO SMD-R/L : SP-R5100	GG94-02355A	
PCB	PCB SP-R5100 R/PCB : SP-R5100	GG41-11071A	
RF1	ELA UNIT-R/L : SP-R5100	GG96-01088A	
D1	DIODE-SCHOTTKY : BAT54AW	0404-001016	
D14	DIODE-ARRAY : BAV70 W, 70 V	0407-001016	
Q20	TR-SMALL SIGNAL : MMBT2907A	0501-000462	
Q6,Q18	TR-SMALL SIGNAL : N, NPN	0501-002046	
Q1	TR-DIGITAL : -, NPN, 200 mW	0504-000127	
Q13	FET-GAAS : BSS138, 50 V, 14 V	0505-001064	
D16	LED : CHIP, YEL, 2 mm, 570 nm	0601-001144	
U13	IC-EEPROM : 24LC04B, 4 k x 8 BIT	1103-001096	
U14	IC-VOLTAGE REGULATOR	1203-001390	
U10	IC-DEC : PCD5091H/C26/F5	1205-001470	
U11	IC-DETECTOR : 5VT30, SOT-23	1209-001048	
L1	R-CHIP : 0 ohm, 5 %, 1/8 W	2007-000033	
R137,C210,L6,L7	R-CHIP : 0 ohm, 5 %, 1/16 W	2007-000070	
R109	R-CHIP : 100 ohm, 5 %, 1/16 W	2007-000074	
R51,R107,R108	R-CHIP : 220 ohm, 5 %, 1/16 W	2007-000075	
R124	R-CHIP : 1 kohm, 5 %, 1/16 W	2007-000078	
R110,R111	R-CHIP : 1 kohm, 5 %, 1/16 W	2007-000078	
R6	R-CHIP : 2 kohm, 5 %, 1/16 W	2007-000080	
R126	R-CHIP : 3.3 kohm, 5 %, 1/16 W	2007-000082	
R31,R82	R-CHIP : 4.7 kohm, 5 %, 1/16 W	2007-000084	
R100,R101,R102	R-CHIP : 10 kohm, 5 %, 1/16 W	2007-000090	
R2,R64,R117,R119	R-CHIP : 10 kohm, 5 %, 1/16 W	2007-000090	
R130	R-CHIP : 12 kohm, 5 %, 1/16 W	2007-000091	
R114,R122,R129	R-CHIP : 47 kohm, 5 %, 1/16 W	2007-000097	

Location No	Description	SEC Code	Remark
RX2	R-CHIP : 100 kohm, 5 %, 1/16 W	2007-000102	
R1,R41,R66,R125,R128	R-CHIP : 100 kohm, 5 %, 1/16 W	2007-000102	
R134	R-CHIP : 470 kohm, 5 %, 1/16 W	2007-000107	
R7	R-CHIP : 1 Mohm, 5 %, 1/16 W	2007-000109	
R94	R-CHIP : 82 kohm, 5 %, 1/16 W	2007-000115	
RX1	R-CHIP : 2.2 kohm, 5 %, 1/16 W	2007-000124	
R42	R-CHIP : 27 kohm, 5 %, 1/16 W	2007-000129	
R121	R-CHIP : 10 ohm, 5 %, 1/16 W	2007-000309	
R116	R-CHIP : 4.7 ohm, 5 %, 1/16 W	2007-000882	
R50	R-CHIP : 510 ohm, 5 %, 1/16 W	2007-001002	
R123	R-CHIP : 8.2 kohm, 5 %, 1/16 W	2007-001179	
C29,C131,C132,C135	C-CERAMIC, CHIP : 100 nF	2203-000189	
C111~C113,C115	C-CERAMIC, CHIP : 100 nF	2203-000189	
C117,C121,C122	C-CERAMIC, CHIP : 100 nF	2203-000189	
C119	C-CERAMIC, CHIP : 100 pF	2203-000236	
C126	C-CERAMIC, CHIP : 10 nF	2203-000257	
C120,C137,C152	C-CERAMIC, CHIP : 10 pF	2203-000280	
C150,C151,C156,C161	C-CERAMIC, CHIP : 1 nF	2203-000440	
C109	C-CERAMIC, CHIP : 1 uF	2203-000476	
C123,C124	C-CERAMIC, CHIP : 2.2 nF	2203-000491	
C128	C-CERAMIC, CHIP : 22 pF	2203-000624	
C101,C162	C-CERAMIC, CHIP : 4.7 nF	2203-000888	
CX2	C-CERAMIC, CHIP : 470 pF	2203-000950	
C138,C139	C-CERAMIC, CHIP : 56 pF	2203-001074	
C140,C153,CX3	C-CERAMIC, CHIP : 6.8 pF	2203-001109	
C49,C118,C154,C155	C-CERAMIC, CHIP : 6.8 pF	2203-001109	
C158,C159,C160	C-CERAMIC, CHIP : 6.8 pF	2203-001109	
C125,C127,CX1,CXX1	C-CERAMIC, CHIP : 6.8 pF	2203-001109	
C4	C-TA, CHIP : 10 uF, 20 %, 6.3 V	2404-000141	
C1,C3	C-TA, CHIP : 33 uF, 20 %, 6.3 V	2404-000226	
C2,C5,C6	C-TA, CHIP : 100 uF, 10 %, 6.3 V	2404-000277	
L3,L4	INDUCTOR-SMD : 1 uH, 10 %	2703-001183	
X1	CRYSTAL-SMD : 13.824 MHz	2801-003596	
B1	BUZZER-MAGNETIC : 81 dB, 1.5 V	3002-000126	
MIC	MIC-CONDENSOR : 1.5 V, 300 uA	3003-001017	
E1	AUDIO-RECEIVER : 150 ohm	3009-001012	
CON1	CONNECTOR-HEADER : BOX, 2 P	3711-000827	

4. Base Key Parts List

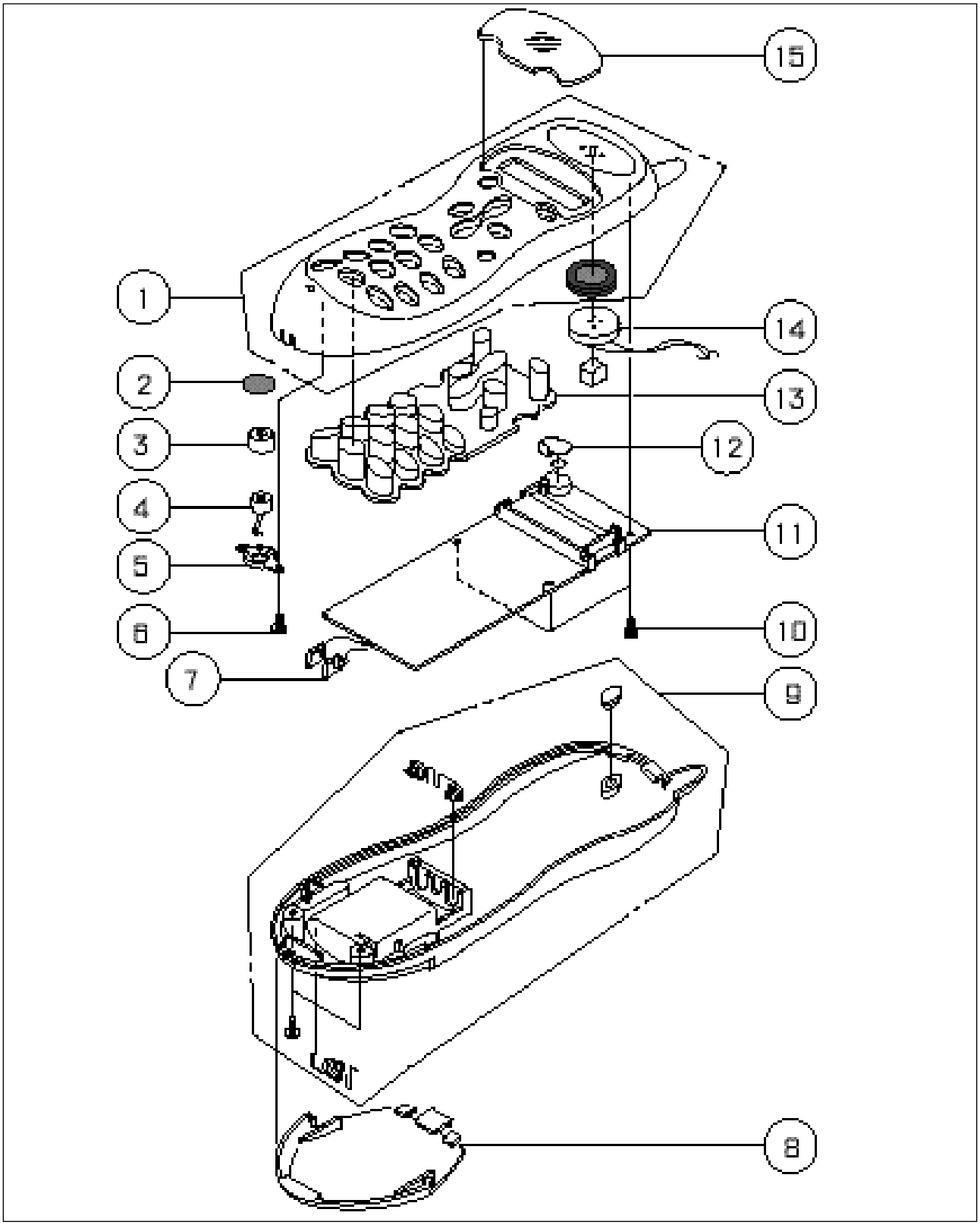
Location No	Description	SEC Code	Remark
B/KEY SMD	PRA AUTO SMD-SP-R5150	GG94-02492A	
Q251, Q252	TR-SMALL SIGNAL : KSC1623	0501-000342	
U1	IC-TTL : 74LS164, SHIFT REGI	0803-000465	
R262, R263	R-CHIP : 100 ohm, 5 %, 1/10 W	2007-000290	
R251, R252, R260, R261	R-CHIP : 10 kohm, 5 %, 1/10 W	2007-000300	
R253, R254, R255, R256	R-CHIP : 220 ohm, 5 %, 1/10 W	2007-000572	
R257, R258, R259	R-CHIP : 220 ohm, 5 %, 1/10 W	2007-000572	
C251, C259, C260	C-CERAMIC, CHIP : 100 nF, 10 %	2203-000204	
C252, C253, C254, C255	C-CERAMIC, CHIP : 68 nF, 10 %	2203-001142	
C256, C257, C258	C-CERAMIC, CHIP : 68 nF, 10 %	2203-001142	
LED1	LED : ROUND, GRN, 5 mm, 565 mm	0601-001110	

5. Charger Parts List

Location No	Description	SEC Code	Remark
HARNESS	CBF HARNESS-:-,-,-, 125 MM	GG39-40548A	
SMD	PRA AUTO SMD-SP-R5060	GG96-02220A	
PCB	PCB-CHARGER PCB : SP-R5100	GG41-11073A	
AXL	PRA AUTO AXL-5100 : SP-R5100	GG94-02356A	
R1	R-METAL OXIDE : 68 ohm, 5 %, 1 W	2003-000358	
CN1	CONNECTOR-HEADER : BOX, 2 P	3711-000827	
M1	JACK-MODULAR: 6 P/4 C	3722-001263	

10. Exploded Views and Parts Lists

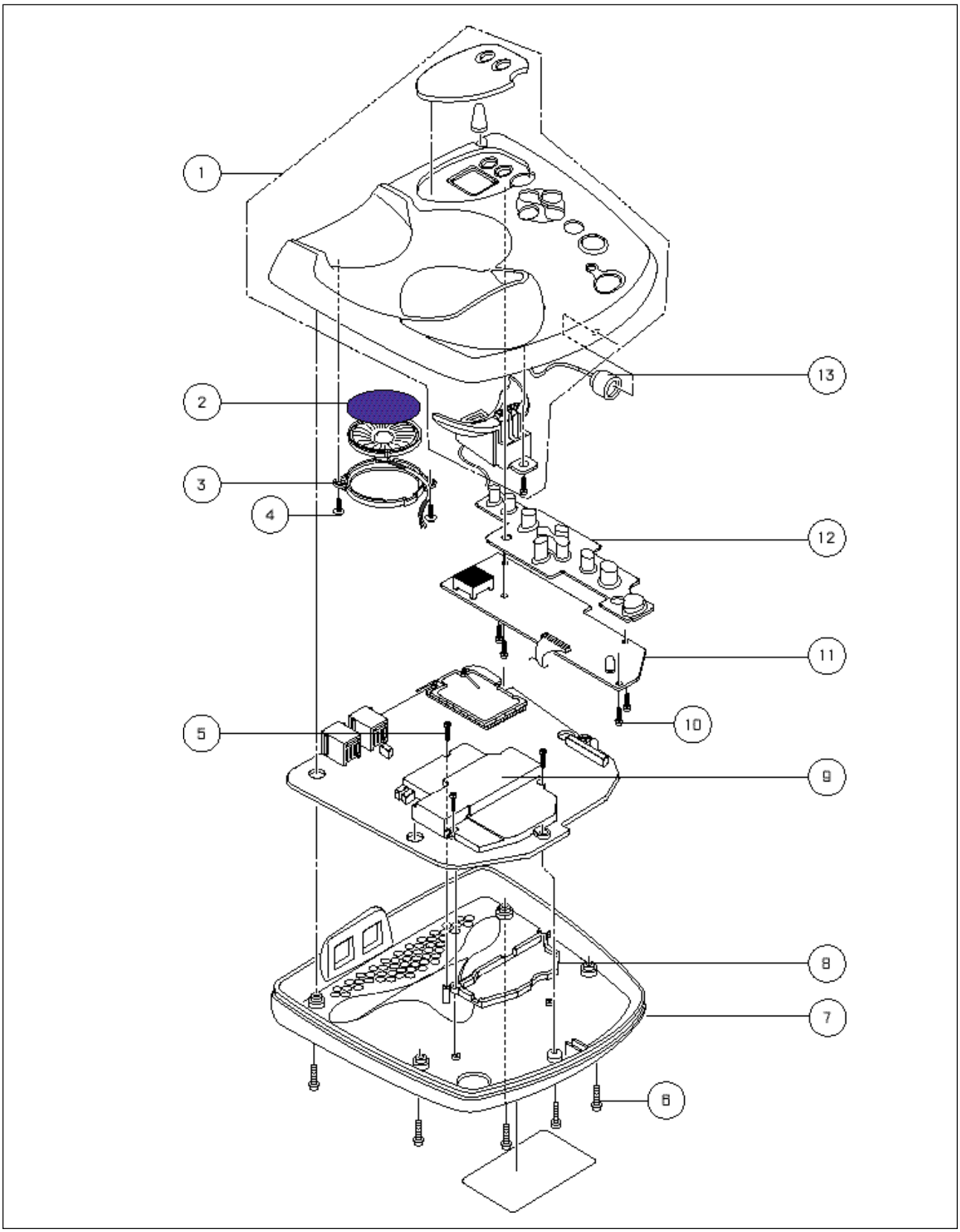
1. Remote Exploded View



2. Remote Parts List

Location No.	Description	SEC Code	Remark
1	R/M LOWER ASS'Y	GG75-11149A	
2	MIC FILTER	GG74-10541A	
3	MIC HOLDER	GG73-40547A	
4	MIC	3003-001017	
5	MIC BRACKET	GG72-41449A	
6	SCREW M3 L10	6003-000159	
7	CONTACT "R", "L"	GG70-10633,4A	
8	BATTERY COVER	GG72-42559A	
9	R/M UPPER ASS'Y	GG75-11150A	
10	M2,5 L8 SCREW	6003-000149	
11	PBA	GG92-01219A	
12	BUZZER HOLDER	GG73-40706A	
13	KEY-PAD	GG73-40704A	
14	AUDIO RECEIVER	3009-001012	
15	LCD WINDOW	GG72-42565A	

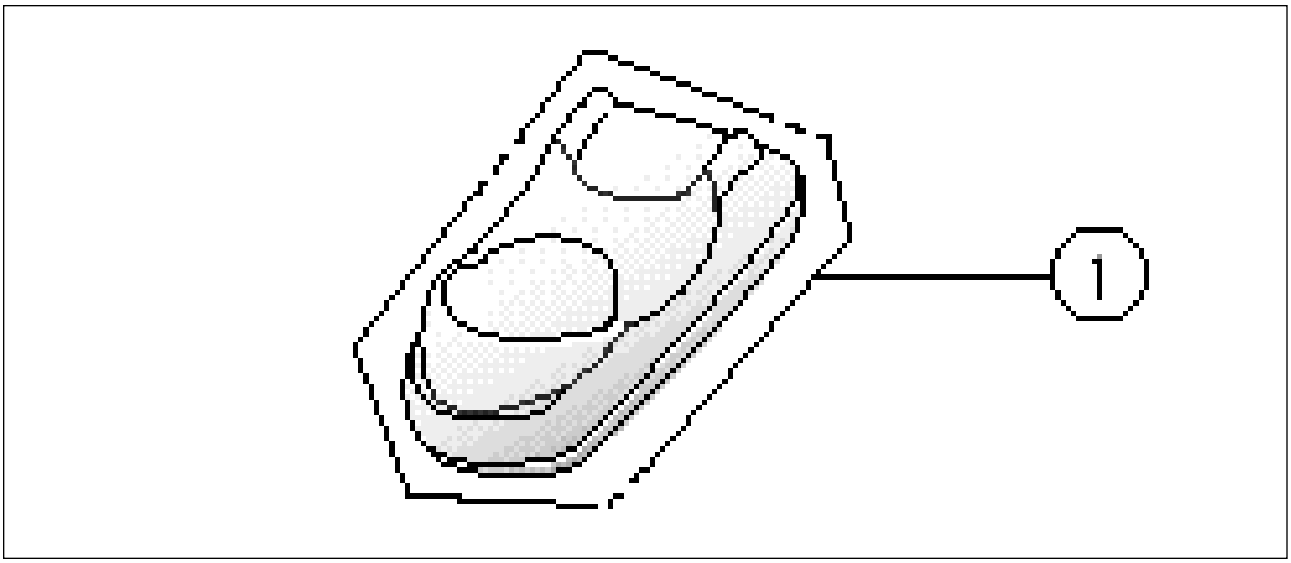
3. Base Exploded View



4. Base Parts List

Location No.	Description	SEC Code	Remark
1	HOUSING ASS'Y	GG75-11163A	
2	SPONGE SPEAKER	GG74-10502B	
3	SPEAKER BRACKET	GG72-42513A	
4	SCREW M3, L8	6003-000259	
5	SCREW M2, L8	6003-000232	
6	SCREW M3, L10	6003-000159	
7	BASE PLATE ASS'Y	GG75-11164A	
8	SHIELD CAN LOWER	GG72-42571A	
9	SHIELD CAN UPPER	GG72-42570A	
10	SCREW M2,5, L6	6003-000193	
11	BASE KEY PBA	GG92-01265A	
12	RUBBER CONTACT	GG73-40707A	
13	MIC HOLDER	GG73-40710A	

5. Charger Exploded View

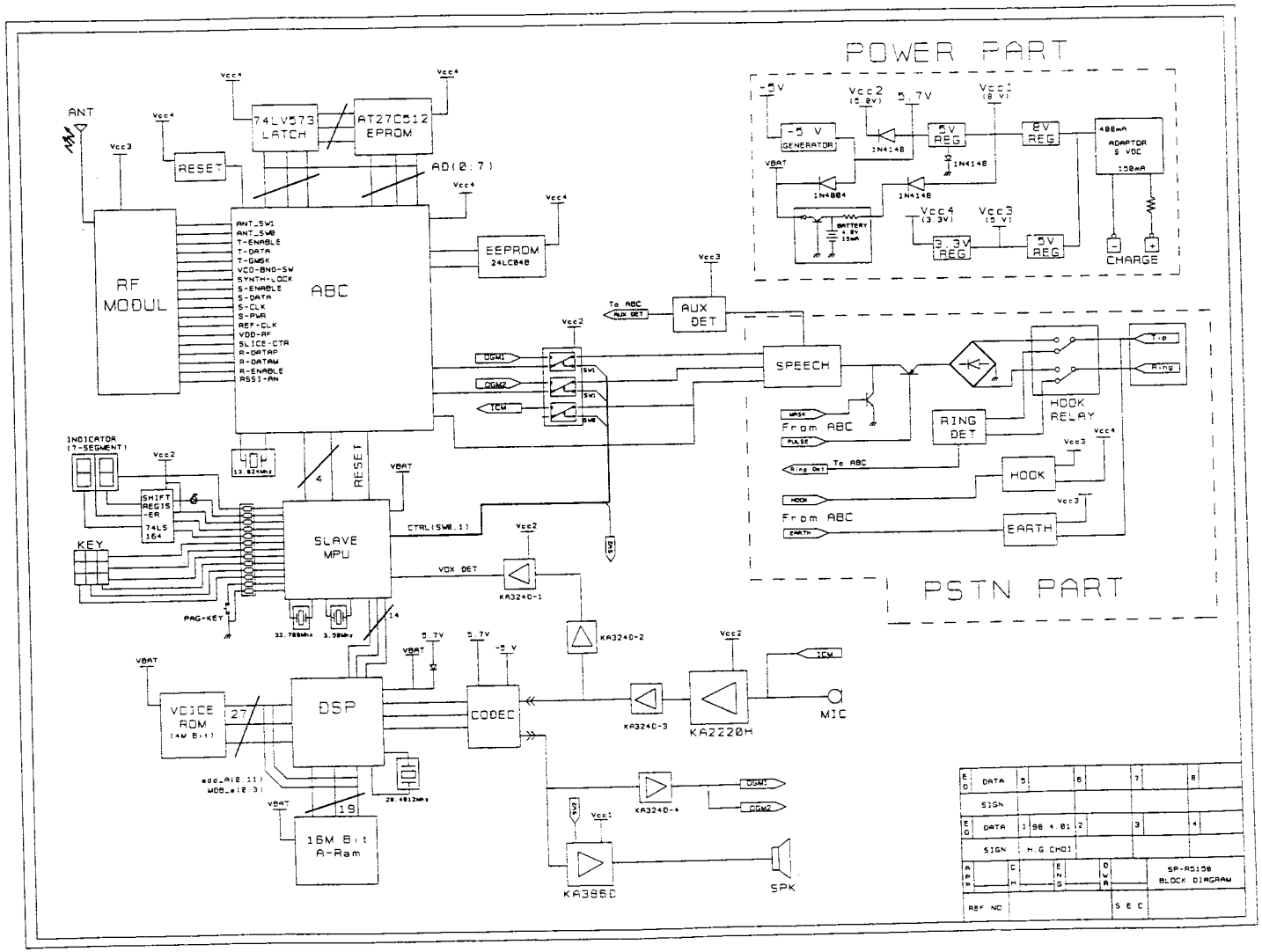


6. Charger Part List

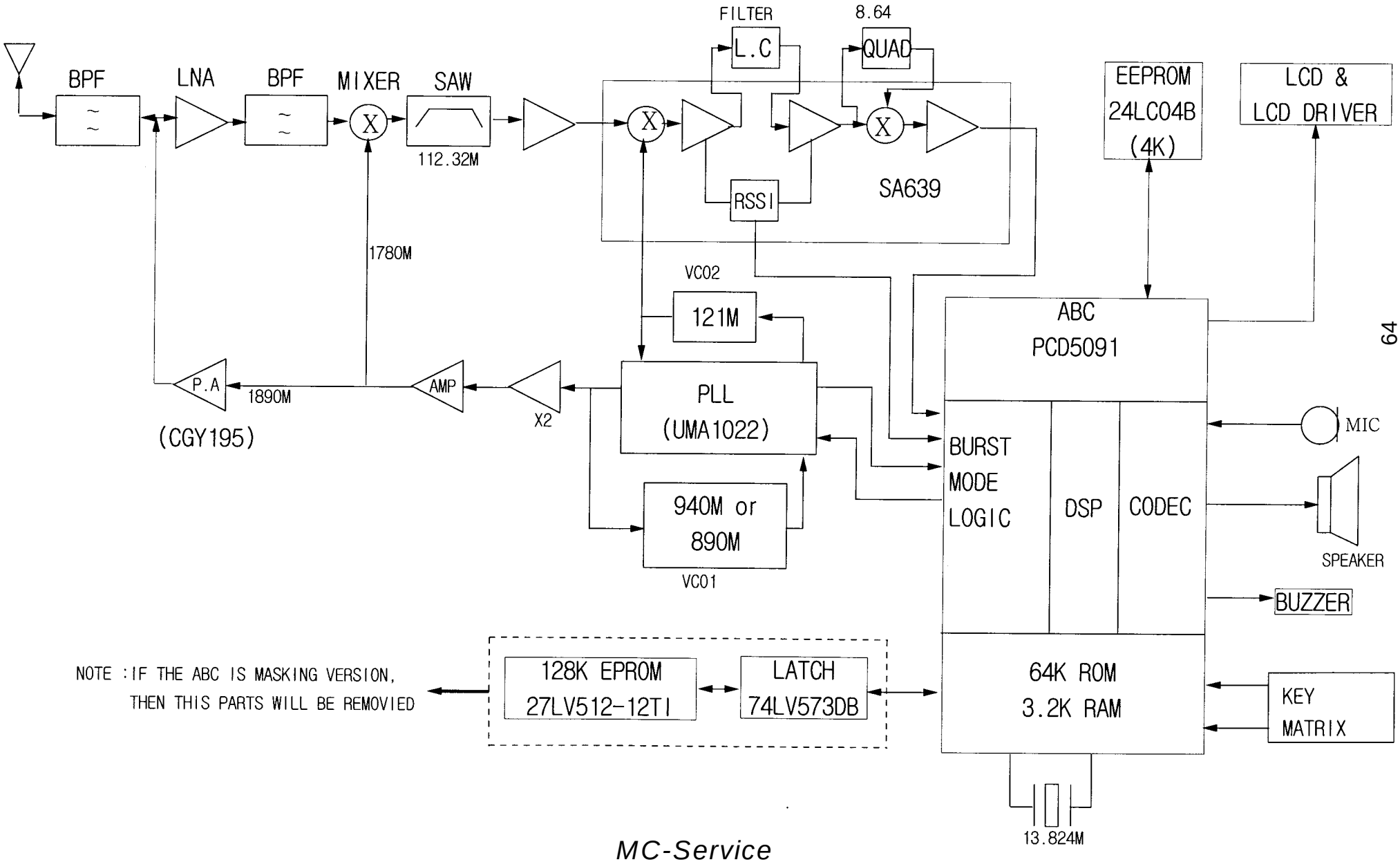
Location No.	Description	SEC Code	Remark
1	CHARGER ASS'Y	GG97-01721A	

11. Block Diagram

1. Base Block Diagram



2.THE SP-R5150 BLOCK DIAGRAM OF P.P.



2. REMOTE BLOCK DIAGRAM

12. Schematic Description and Diagram

1. CIRCUIT DESCRIPTIONS OF HANDSET RF

1-1 INTRODUCTION

The system uses the T.D.D.method that the system receives RX signals and transmits TX signals through only one antenna and carrier frequency. The system also uses the TDMA method using one slot among24slots. The frequency range of TX and RX is from 1881.792MHz to 1897.344MHz.
The equipment uses DECT RF module.

1-2 DESCRIPTION

1) ANTENNA
The system uses the antenna of •Ñ4 herical type to communicate with the microwave signal.
2) RF module
The operating voltage of this module is 3.6Vdc normally and supplied by BATT directly.
The clock of module uses 13.824MHz. The outgoing siginals of module are SLICE OUT, DEMODE OUT,VCC REFand RSSI siginal.

This RF module°Ø pin assignments are as follows.

A) Vcc	:	9 and 10 are TX POWER SUPPLY. 28 is the supply voltage for other circuits within RF Module.
B) GND	:	1,3,5,6,7,15,30,31 and 32.
C) TX PA RAMP	:	It controls transmit power AMP.(pin number :8) In case of ¼°±state, it turns on the TX power AMP. In case of ¿°±state, it turns off the TX power AMP. Its pin number is 5
D) SLICE OUT		The reference voltage of data comparator (pin number :16). In case of ¼°±state, it holds reference voltage. In case of ¿°±state, it is S-field tracking mode.
E) DEMODE OUT	:	This pin presents demodulated signal (pin number :18).
F) SLICE CTRL	:	It controls the tracking or holding of data slice (pin number :17). In case of ¼°±state, it keeps data slice. In case of ¿°±state, it is tracking mode.
G) PLL CTRL	:	This pin controls PLL power (pin number :20). This pin is active° ¿°±state.
H) PLL ENABLE	:	This pin is synthesizer enable input(pin number :21).
I) BATT. SAVE	:	This controls the main power of RF module (pin number :25). In case of ¼°±state, the RF module°Ø power is supplied.
J) PLL DATA	:	This is synthesizer data input pin binary (pin number :22).
K) TX ENABLE	:	This controls the power of transimitting circuit(pin number :13). In case of ¿°± the power is to supply TX circuit.
L) PLL CLOCK	:	This is synthesizer clock input for serial registers(pin number :23).
M) RX ENABLE	:	This controls RX path and antenna switch(pin number :14). In case of ¿°± the RX path turn on.
N) VCO BND S/W	:	This is the input of VCO band switch (pin number :27). In case of ¼°±it selects transmitting ferquency. In case of ¿°±it selects receiving frequency.
O) VCC REF	:	This is 2.9Vdc reference output for BMC interface (pin number :29).
P) TX DATA	:	This is transmit data input(pin number :26). When it is not active this pin goes to high impedance state
Q) SYS CLOCK	:	This is RF module clock input pin(pin number :24) and its frequency is 13.824MHz.
R) RSSI	:	This is RSSI output pin(pin number :19) and its voltage level is related to signal level.

2. CIRCUIT DESCRIPTIONS OF HANDSET LOGIC

2-1 INTRODUCTION

The HANDSET LOGIC B°Ø controls its RF part and TX & RX AUDIO signals, and controls charging current and performs lots of user oriented functions by sensing the keys, and controls LCD displays, MIC and buzzer.

2-2 KEY PAD

The KEY PAD consists of 3 ° 6ømatrix key. The 6 rows are connected with 6 ports of CPU and the CPU usually controls these ports to keep its level high. Respectively, the3 columns are connected with 3 ports of the CPU and the CPU usually controls these ports to keep its level low. If a certain key is pressed, the column and the row are short- circuited and the column°ø voltage become high.
The CPU senses the change of the voltage condition, then changes all row°ø level low and generates pulse(strobe) signal to 6 rows in order. At this moment, there is no signal on the unpressed column, but the strobe signal is detected on the pressed column. That indicates the key is pressed.

2-3 EEPROM

The EEPROM used in the HANDSET is PCF8594C which is made by PHILIPS.
The EEPROM stores the initial data, it°ø ID number, telephone numbers for the memory dial function and country adaptation value including volume data.

2-4 RSSI DETECTOR

The RF module outputs DC voltage in proportion to the RF input level through the internal RSSI circuit and the MPU checks the point of the DC voltage level. This pin is used for channel and slot scanning.

2-5 POWER SUPPLY CIRCUIT

The power used in HANDSET is a rechargeable BATTERY(3.6VDC, 530mAH) which is combined with 3 batteries of 1.2V Ni-MH in serial.

2-6 TX & RX AUDIO CIRCUITS

The TX audio signal from the CONDENSER MIC goes to the MPU whose reference level is4mVrms.
The MPU converts this audio signal to digital using internal DSP. These digital voice signals are transmitted to BASE SET by HAND SET RF.
The RX digital signal from the BASE RF inputs the HAND SET RF module and then that digital siginal is converted into analog audio by the MPU. These audio signals go to the ear piece directly.

2-7 CURRENT CHARGE CIRCUIT

This equipment°ø charging method uses normal and trickle charge. Normal charge is0.1c for 15 hours after full discharge and then this equipment goes to trickle charge mode continuously.
Normal or trickle mode is selected by the MPU pin xx. In case of normal charge mode, the MPU goes to ° HIGH° state and turns on Q18. The Q20 is controlled by Q18.

3. CIRCUIT DESCRIPTIONS OF BASESET RF

3-1 INTRODUCTION

The circuit of BASESET RF is similar to that of HANDSET RF. The difference between two circuits is only antenna method. In DECT, the antenna of BASE has 2 kinds. One is vertical ANT.and another is horizontal ANT.

3-2 DESCRIPTION

1) ANTENNA
The system uses the antenna whose length is •Ñ4 to communicate with the microwave signal. Because of high frequency characteristic DECT has diversity antenna. One is vertical ANT. and another is horizontal ANT.

2) RF module
The operating voltage of this module is 5Vdc and supplied by power adaptor.
The clock of module uses 13.824MHz. The out siginals of module are SLICE OUT, DEMODE OUT,VCC REFand RSSI siginal.
This RF module°Ø pin assignments are as follows.

A) Vcc	:	9 and 10 are TX POWER SUPPLY. 28 is the supply voltage for other circuits within RF Module.
B) GND	:	1,3,5,6,7,15,30,31 and 32.
C) TX PA RAMP	:	It controls transmit power AMP.(pin number : 8) In case of ´Ø°±state, it turns on the TX power AMP. In case of ¿Ø°±state, it turns off the TX power AMP. Its pin number is 8.
D) SLICE OUT	:	The reference voltage of data comparator (pin number : 16). In case of ´Ø°±state, it keeps reference voltage. In case of ¿Ø°±state, it is S-field tracking mode.
E) DEMODE OUT	:	This pin outputs demodulated signal (pin number : 18).
F) SLICE CTRL	:	It controls the tracking or hold of data slice (pin number : 17). In case of ´Ø°±state, it keeps data slice. In case of ¿Ø°±state, it is tracking mode.
G) PLL CTRL	:	This pin controls PLL power (pin number : 20). This pin is active° ¿Ø°±state.
H) PLL ENABLE	:	This pin is synthesizer enable input(pin number : 21).
I) BATT. SAVE	:	This controls the main power of RF module (pin number : 25). This pin is pulled up by resistor.
J) PLL DATA	:	This is synthesizer data input pin binary (pin number : 22).
K) TX ENABLE	:	This controls the power of transimitting circuit(pin number : 13). In case of ¿Ø°±, the TX circuit power is supplied.
L) PLL CLOCK	:	This is synthesizer clock input for serial registors(pin number : 23).
M) RX ENABLE	:	This controls RX path and antenna switch.(pin number : 14). In case of ¿Ø°±, the RX path turns on.
N) VCO BND S/W	:	This is the input of VCO band switch (pin number : 27). In case of ´Ø°±it selects transmitting frequency. In case of ¿Ø°±it selects receiving frequency.
O) VCC REF	:	This is 2.9Vdc reference output for BMC interface (pin number : 29).
P) TX DATA	:	This is TX DATA input(pin number : 26). When it is not active this pin goes to high impedance state.
Q) SYS CLOCK	:	This is RF module clock input pin(pin number : 24) and its frequency is 13.824MHz.
R) RSSI	:	This is RSSI output pin(pin number : 19) and its voltage level is related to signal level.

4. CIRCUIT DESCRIPTIONS OF BASESET LOGIC

4-1 INTRODUCTION

The BASE LOGIC B°Ø controls the RF PART, the TX/RX AUDIO process, the telephone line interface and the charging circuit.

4-2 DESCRIPTION

a) TELEPHONE LINE INTERFACE

The telephone line interface separates DC and AC components on the telephone line.
The DC components are used for the SPEECH IC OPERATION and the AC COMPONENTS which mean an AUDIO signal passes to the AUDIO PROCESS CIRCUIT that the two TEL-LINES are connected to the HOOK RELAY.
This HOOK RELAY is operated by the MPU and a switching TR.
The audio signal flows into the BRIDGE DIODE which confirms receiving the constant polarity even though the DC polarity of TEL-LINE is reversed. This line flows into the switching circuit normally and the switching TRs(Q503, Q504, and Q505) are switched to make pulses and Q506 is used for matching the DC impedance during pulse dialing. The tel-line passes to the SPEECH IC(TEA1118AT) which separate the DC and the AC components.
The IC passes the AC component(which means the audio signal) to audio process circuit and carries over the TX audio signal passed from audio process circuit. The DTMF signal which is generated by MPU itself send to SPEECH IC through TX audio path. The ring signal coupled with the C505 goes to the U501(PHOTO COUPLER) and goes to the MPU with the form of the rectangular wave.

b) POWER SUPPLY CIRCUIT

The power supplied from the 9V ADAPTOR is divided into 3 parts.
The one regulated to 5V by the U504(KA7805) is supplied to the RF B°Ø, another regulated to 5V by the U503(KA7805) is supplied to the LOGIC PART and the third 9V is supplied to the charging circuit, Relay and SPK AMP.

c) RING DETECTOR

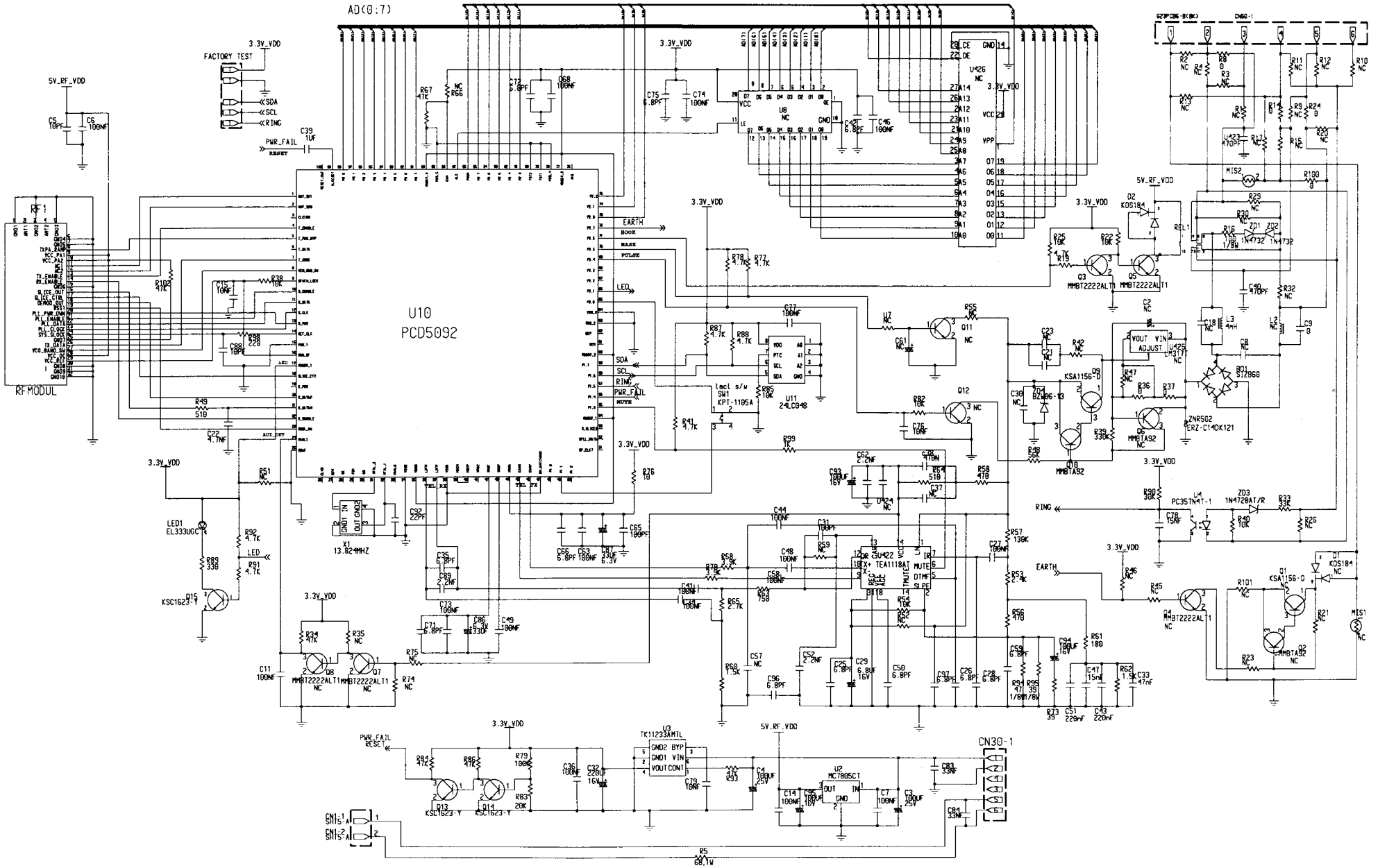
When it receives the ring signal from the telephone line, the ring detector(U4:PHOTO COUPLER) generates the pulse signal according to frequency of ringing signal. At this moment, MPU receives the pulse signal and generates the ringing signal to Buzzer.

d) TX/RX AUDIO CIRCUIT

The RX audio signal from the TEL LINE goes to the MPU (pin37)through the SPEECH IC.
The MPU converts this audio signal into digital by internal DSP.
These digital voice signals are transmitted to RMT SET by BASE RF.
The TX digital signal from the RMT RF inputs the BASE RF module and then the digital siginal is converted into analog audio by the MPU.
Those audio signals go to the TEL LINE through the SPEECH IC

e) INDICATION CIRCUIT

This circuit consists of LEDS to display the baseset operation.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5V_RF_VDD
FACTORY TEST
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SCL
RING
PWR_FAIL
RESET
U10
PCD5092
RF1
RFMODUL
EARTH
HOOK
MASK
PULSE
LED
SDA
SCL
RING
PWR_FAIL
MUTE
X1
13.824MHZ
U11
24LC04B
U426
U8
U423
U7
Q11
Q12
Q9
KSA1156-O
Q10
MMBTA92
Q3
MMBT2222ALT1
Q5
MMBT2222ALT1
Q2
KDS184
REL1
U429
LM317
ZD1
1N4732
ZD2
1N4732
BR1
S12B60
ZNR502
ERZ-C14DK121
U4
PC357N4T-1
ZD3
1N4728AT/R
Q4
MMBT2222ALT1
Q1
KSA1156-O
Q2
MMBTA92
LED1
EL333UGC
D15
KSC1623-Y
Q8
MMBT2222ALT1
Q7
MMBT2222ALT1
Q13
KSC1623-Y
Q14
KSC1623-Y
U3
TK11233AMTL
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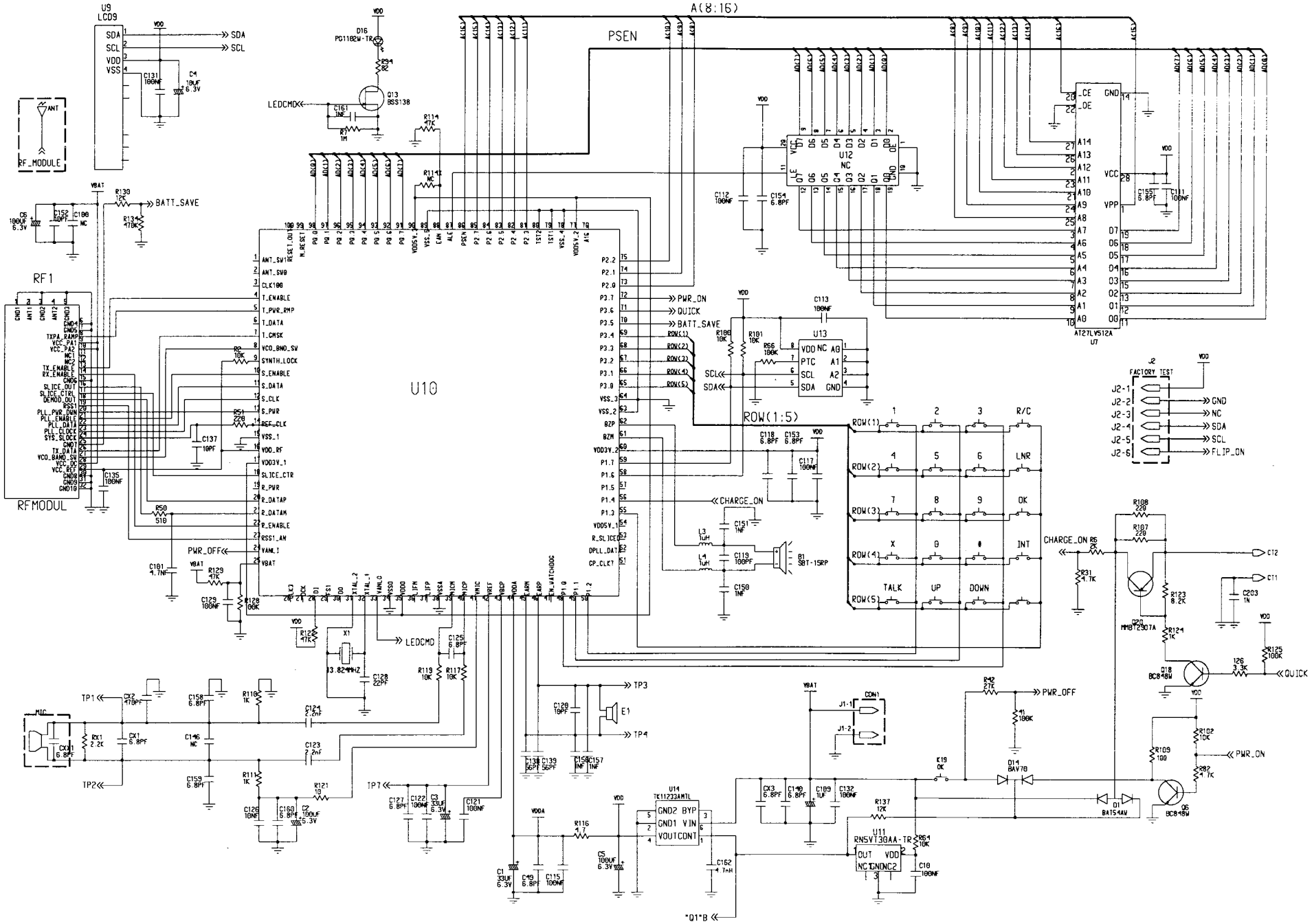
U10
RF1
RFMODUL
RF_MODULE
U9
LCD9
SDA
SCL
VDD
VSS
A(8:16)
PSEN
U12
NC
AT27LV512A
U7
U13
VDD NC A0
PTC A1
SCL A2
SDA GND
ROW(1:5)
1 2 3 R/C
4 5 6 LNR
7 8 9 OK
X 0 # INT
TALK UP DOWN
FACTORY TEST
J2-1 GND
J2-2 NC
J2-3 SDA
J2-4 SCL
J2-5 FLIP_ON
J2-6
PWR_ON
QUICK
BATT_SAVE
CHARGE_ON
PWR_OFF
LEDCMD
VBAT
U14
TK11233AMTL
GND2 BYP
GND1 VIN
VOUTCONT
U11
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OUT VDD
NC GNDNC2
D1
BA154AW
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CON1
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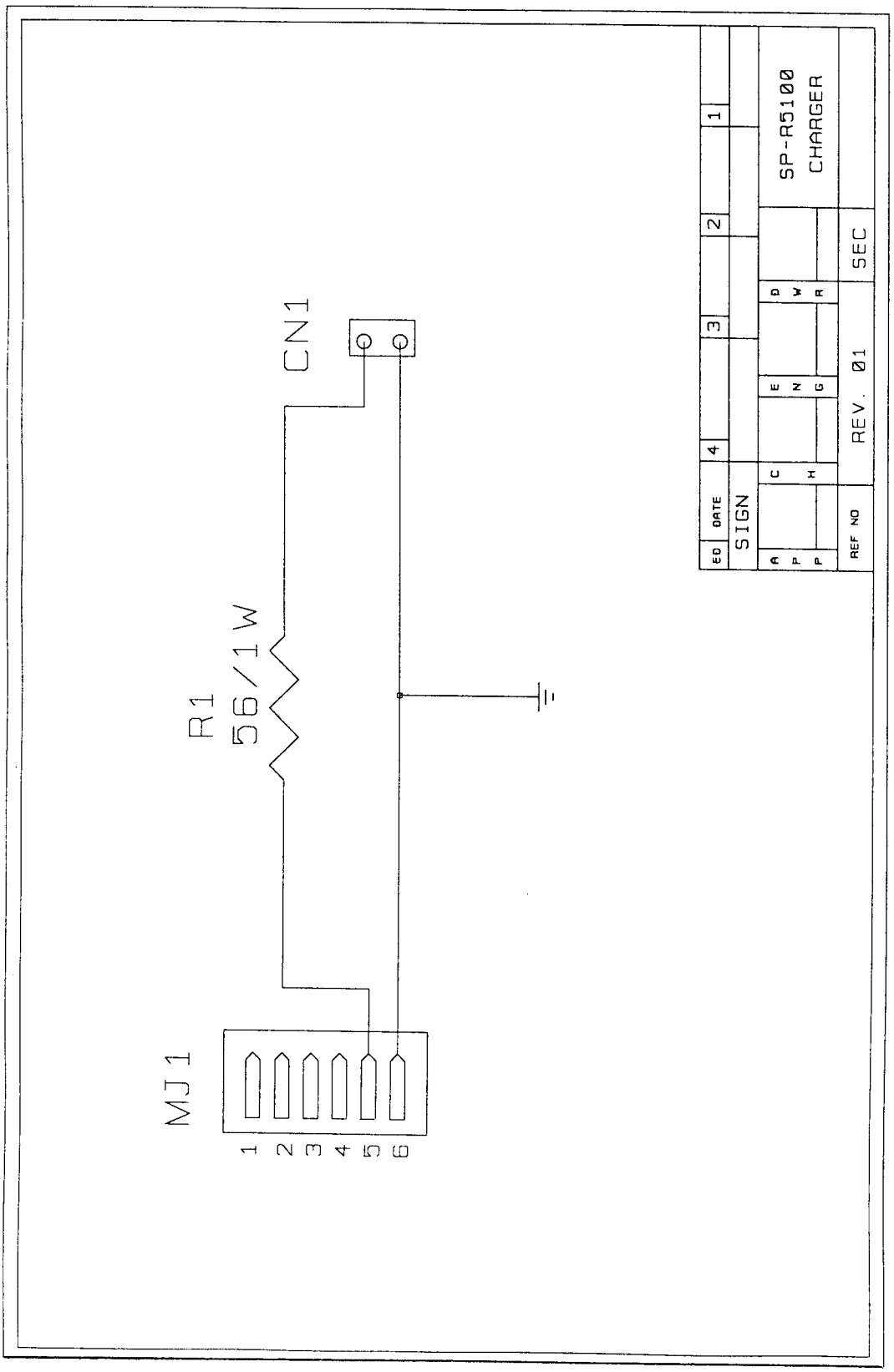
7. CHARGER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MJ1
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